" COMPARATIVE STUDY OF MESH REPAIR AND MESH REPAIR WITH ABDOMINOPLASTY FOR VENTRAL HERNIAS" AT GOVERNMENT MOHAN KUMARAMANGALAM MEDICAL COLLEGE , SALEM

Dissertation submitted to

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MEDICAL COLLEGE, SALEM

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MEDICAL COLLEGE, SALEM

DECLARATION BY THE CANDIDATE

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Place: Salem

Date :

Signature of the Candidate

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Ethical Committee Meeting held on 23.12.2015 at 11.00 A.M in the Seminar Hall, IInd Floor, Medicine Block, Govt. Mohan Kumaramangalam Medical College Hospital, Salem - 01.

Name of the Presenter with Address	Title	Name of the Guide and Address	Whether it is Approved or not.
Dr. Jithu George , I Year, Post Graduate Student of MS (General Surgery), GMKMC, Salem-30.	"Comparative Study of Mesh Repair and Mesh Repair with Abdominoplasty for Ventral Hernias in GMKMCH, Salem During Jan 2016-Jan 2018."	Dr. A. Nirmala, MS., Professor of General Surgery, GMKMC, Salem.	Approved

The Ethical Committee examined the studies in detail and is pleased to accord Ethical Committee approval for the above Post Graduate student of this College to carry out the studies with the following conditions.

1. He should carry out the work without detrimental to regular activities as well as without extra expenditure to the institution to Government.
2. He should inform the institution Ethical Committee in case of any change of study procedure site and investigation or guide.
3. He should not deviate from the area of the work for which applied for Ethical clearance. He should inform the IEC immediately, in case of any adverse events or serious adverse reactions.
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– Forwarded to Dr. Jithu George –

11/01/16

Prof. Dr. C. RAJASEKARAN, M.S., (Gen. Surgery)
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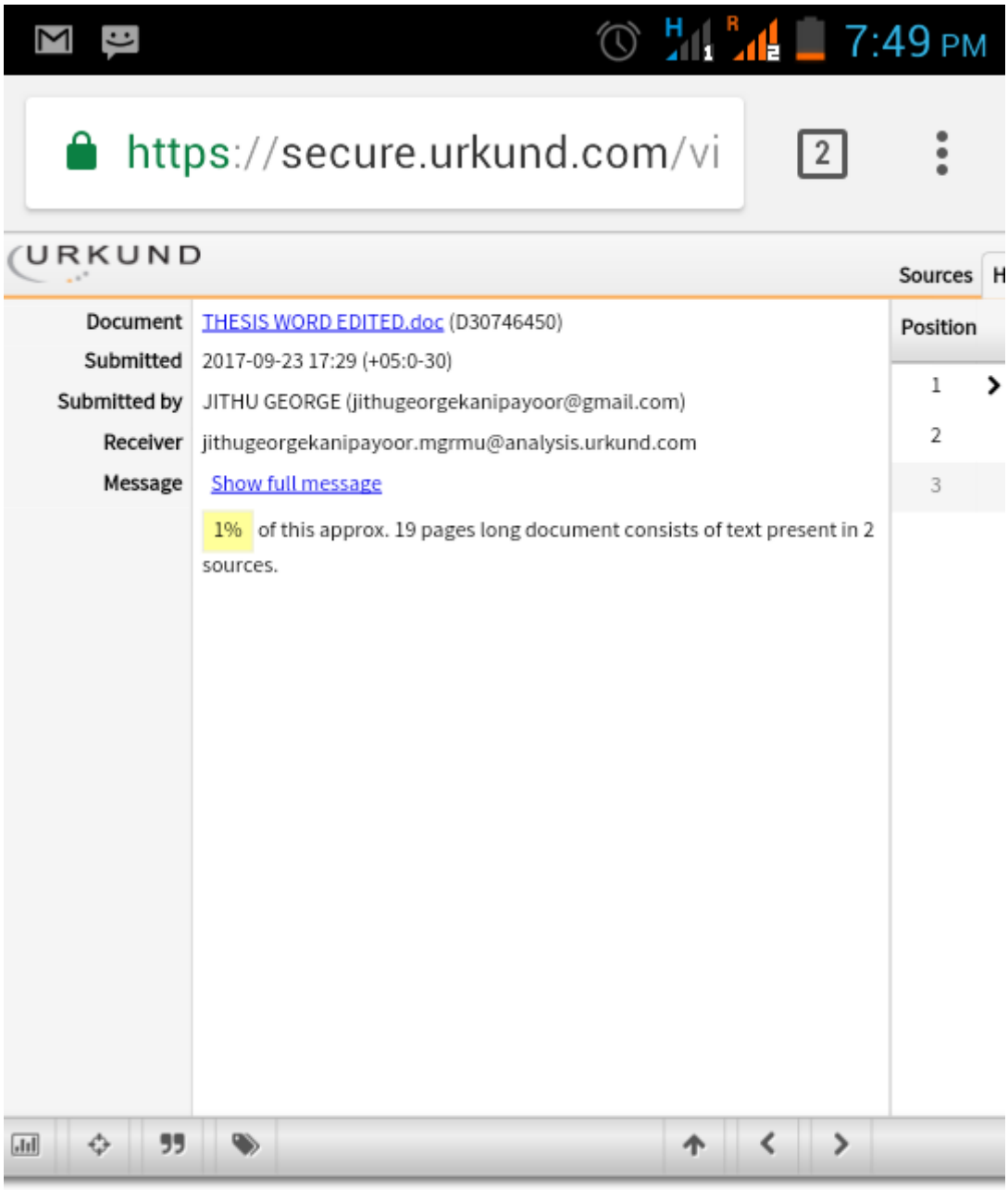
The Individual.



INTRODUCTION

Hernias are very common surgical condition. Millions of new patients are added to the pool in each year. Most common type of hernia is inguinal hernia. Ventral hernias are , hernias arising from anterior abdominal wall which includes umbilical , paraumbilical , incisional , epigastric hernias.

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http://www.mananatomy.com/body-systems/muscular-system/transversalis-fascia
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ABSTRACT

Ventral hernias are common next to inguinal hernias. Ventral hernias with small defects are repaired anatomically. Large defects are reinforced with mesh. There is a novel technique of combining mesh repair for ventral hernias with abdominoplasty in a single sitting. Here in this study, two groups of patients who underwent mesh repair alone and mesh repair with abdominoplasty for ventral hernias and compared in terms of duration of surgery, hospital stay, ambulation after surgery ,complications like surgical site infections, seroma formation, flap necrosis, recurrence and cosmetic out comes like change in abdominal girth.

Key words :Mesh repair, abdominoplasty

AIM OF THE STUDY:

To assess and compare mesh repair alone and mesh repair with abdominoplasty for ventral hernias in terms of duration of surgery, hospital stay, ambulation after surgery , surgical site infections, flap necrosis, seroma formation, recurrence and change in abdominal girth

MATERIALS AND METHODS:

This prospective comparative clinical study of 60 cases of ventral hernias admitted in Government Mohan Kumaramangalam Medical College Hospital , Salem was done in the period from DECEMBER 2015 to SEPTEMBER 2017.The cases were evaluated through proper history taking , clinical examination, operative procedure and post operative follow ups.

OBSERVATION:

The data of patients who underwent mesh repair alone and mesh repair with abdominoplasty were compared in terms of duration of surgery, hospital stay, ambulation, surgical site infections, flap necrosis, seroma formation, recurrence and change in abdominal girth. Statistical significance between two groups were found out by using standard error of difference between means and standard error of difference between proportions .

CONCLUSION:

By combining abdominoplasty with mesh repair for ventral hernia repair, duration of surgery, drain collection per day, number of days drain kept were increased. Flap necrosis and recurrence were not having any statistical difference in between two groups .Statistically significant change in abdominal girth was noted in patients who underwent mesh repair with abdominoplasty

.

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LIST OF ABBREVIATIONS USED

M	male
F	Female
Yrs	years
No of	Number of
CT	computerized tomography
D O A	Date of admission
D O S	Date of surgey
D O D	Date of discharge
DM	Diabetes Mellitus
RR	Respiratory rate
BP	Blood Pressure
P/R	Per Rectal
P/V	Per Vaginal
Hb	Haemoglobin
ECG	Electrocardiogram
USG	Ultrasonogram
SA	Spinal anaesthesia

INTRODUCTION

Hernias are very common surgical condition. Millions of new patients are added to the pool in each year. Most common type of hernia is inguinal hernia. Ventral hernias are , hernias arising from anterior abdominal wall which includes umbilical, paraumbilical, incisional, epigastric hernias. Ventral hernias arises due to weakness of the abdominal wall. The laxity of abdominal wall can be due to various reasons . It can be due to congenital weakness, after pregnancy, previous surgeries, weight lifting, chronic cough. Incisional hernias are common among ventral hernias. Vertical scars, scar of emergency surgeries, faulty technique in closure of abdomen, layered closure of abdomen, systemic diseases contribute to incisional hernias.

There are different methods including lap and open, with mesh and without mesh for the surgical treatment of ventral hernias. Each type have its own advantages and disadvatages. Here in this study we are comparing ventral hernia repair with mesh and ventral hernia repair with mesh and abdominoplasty as a combined procedure . Abdominoplasty is an abdominal countouring procedure in which skin and subcutaneous tissue excised and abdominal musculature are tightened. It is basically a cosmetic procedure .So in countries like USA and Canada,

abdominoplasty is not covered in universal insurance scheme. But when excess skin and subcutaneous tissue hangs down to perineal region on standing , procedure , abdominoplasty is medically indicated and not considerd as a cosmetic procedure. There are various studies , indicating the association of ventral hernias , with obesity. As excess pannus hangs on the abdominal wall, it causes weakness of already weakened abdominal wall and causes ventral hernias. Obesity may worsen existing ventral hernia, and sometimes patients develop ventral hernia after gaining substantial amount of tissue around the waist . Even if patient undergoes surgery for ventral hernias without weight reduction or lipodermectomy , cosmetic outcome wont be that much good , and higher chances for recurrence are there. Studies and experience of surgeons and patients from various parts of the world have shown that weight reduction, abdominoplasty in various forms as per the need of patient along with surgery have much more good outcome in forms of cosmetic outcome and recurrence. As bariatric and metabolic surgeries are common now a days , abdominoplasty is combined as a follow up procedure for bariatric surgeries .Studies were done to know whether a abdominoplasty procedure alone ,which decreases the central obesity ,in turn decrease the chances for cardio vascular diseases, metabolic

syndrome ,and other co morbidities associated with central obesity. Studies showed discouraging results.

Even though there are a lot of advantages of combining ventral hernia repair along with abdominoplasty, there are many technical and surgical difficulties. In West, financial issues posses a significant problem as these are not covered in insurance schemes. Technically only those with morbid obesity are covered under scheme. Surgical technical difficulties like extent of lipodermectomy, increased operating time, long hospital stay, duration of drains to be kept, chances of infections after surgery, cosmetic outcomes in the form of reduced abdominal girth , are studied and compared in various studies. Most of the studies show not much complications in combining ventral hernia repair with abdominoplasty

The basic concept of hernia repair also is to strengthen the abdominal wall. Then it comes to the question of combining two procedures, ventral hernia repair with abdominoplasy and its advantages and disadvantages over simple mesh repair in terms of different parameters. Adel Tolba et al[6],studied complications arising from combining mesh repair and abdominoplsty . Wagih mommtaz

Ghnam[5] studied the complications arising from for combined procedure of abdominoplasty and ventral hernia repair.

This study has analysed simple mesh repair to combined procedure of mesh repair with abdominoplasty in 60 patients who underwent surgery in our hospital. These patients are admitted in various surgical units and departments like surgical gastroenterology and plastic surgery.

REVIEW OF LITERATURE

HISTORY

- Nyhus, the pioneer in hernia surgery stated that history of surgery is extremely interlinked with that of history of hernia repair
- Ancient Egyptian, Mesopotomian and Assyrian people have recorded hernias and described various surgeries and treatment methods
- Surgical interventions are detailed in various scriptures
- Remains of Pharaohs suggest that they suffered hernias and underwent treatments for the same
- Greeks, Pioneers of modern medicine ,through their rationale and logical approach, elaborated symptoms and treatment
- After dark middle ages, during the period of renaissance ,anatomy of hernial defects became clear. But still effective surgical treatment was questionable till last decade of 19^{th} century
- Middle of 18^{th} century, surgical anatomists began to understand the complex anatomy of hernias, various types of hernias and how they form

- Anaesthesia came to scene in the 19th century ,with modern techniques to control and block pain, surgical techniques were also improvised, and Age of modern surgery was born
- Early surgical treatments were based on tissue repair techniques
- Italian surgeon, Bassini described anatomy and tissue repair techniques
- Over next years various techniques were described by Marcy, Shouldice, Halsted
- For incisional hernias, transcutaneous suturing was used in 1880s
- Aponeurotic techniques, by suturing anterior and posterior rectus sheath were also used for surgical repair of ventral hernias
- Mayo developed 'waist coat plasty' by overlapping musculo aponeurotic planes ,for umbilical hernias
- Auto transplant, hetero transplant of fascia lata were introduced in 1940s for ventral hernia repairs
- Autologus tissues like cartilage, periosteum were used
- Wallace Carothers of Dupont Inc discoverd polymers

- From 1940s various synthetic polymers were used for the inguinal hernia repair
- First nylon was introduced ,followed by orlon, Dacron
- In 1950 prolene mesh was used for hernia surgery which was a path breaking achievement
- Abdominoplasty were first performed by surgeons who encounterd a excess skin and fat during umbilical hernia repair
- The first procedure was done in MARYLAND USA
- Thorek in 1924 was the first surgeon who pioneered technique to keep umbilicus intact
- Pitangay in 1967 introduce lipectomy
- Until 1970's vertical, horizontal and a combination of these incisions were commonly used for abdominoplasty In 1973 Grazer used bikini incision
- In 1973 Grazer used bikini incision
- Lower abdominal horizontal incisions, few cms over pubic symphysis have been preferred since 1980

- In 1978 Psillakis was the first to pioneer the technique of suture placation of oblique muscles
- It was known as TUMMY TUCK operation at that time, and is also being used now a days
- It underwent a number of changes. Huge increase for reconstructive procedures during world wars brought the rapid improvements in techniques used for abdominoplasty
- Previously abdominoplasty was the only available option for patients who were undergoing body contour changing procedures. With advent of liposuction, liposuction alone or a combination of liposuction with abdominoplasty are available, and thus increased 'fine tuning' in abdominal countouring procedures
- During the past 4 decades surgeons are ,finding new ways to reduce scars and to increase significant changes in body contour which were aesthetically appealing
- From 1990 s itself surgeons from various parts of the world were doing studies on combining abdominoplasty with hernia repair

- But due to cost effects, and as it was not covered in the Insurance schemes, minimal number of patients were undergoing such procedures
- Obesity, which attained a status of epidemic in the West, necessitated the need for bariatric and metabolic surgeries
- Following weight loss patients have to undergo truncal rejuvenation procedures like abdominoplasty for removing excess skin and fat
- Ventral hernia repair and abdominplasty, even though they are two different procedures addresses the common problem

LAYERS OF ABDOMINAL WALL

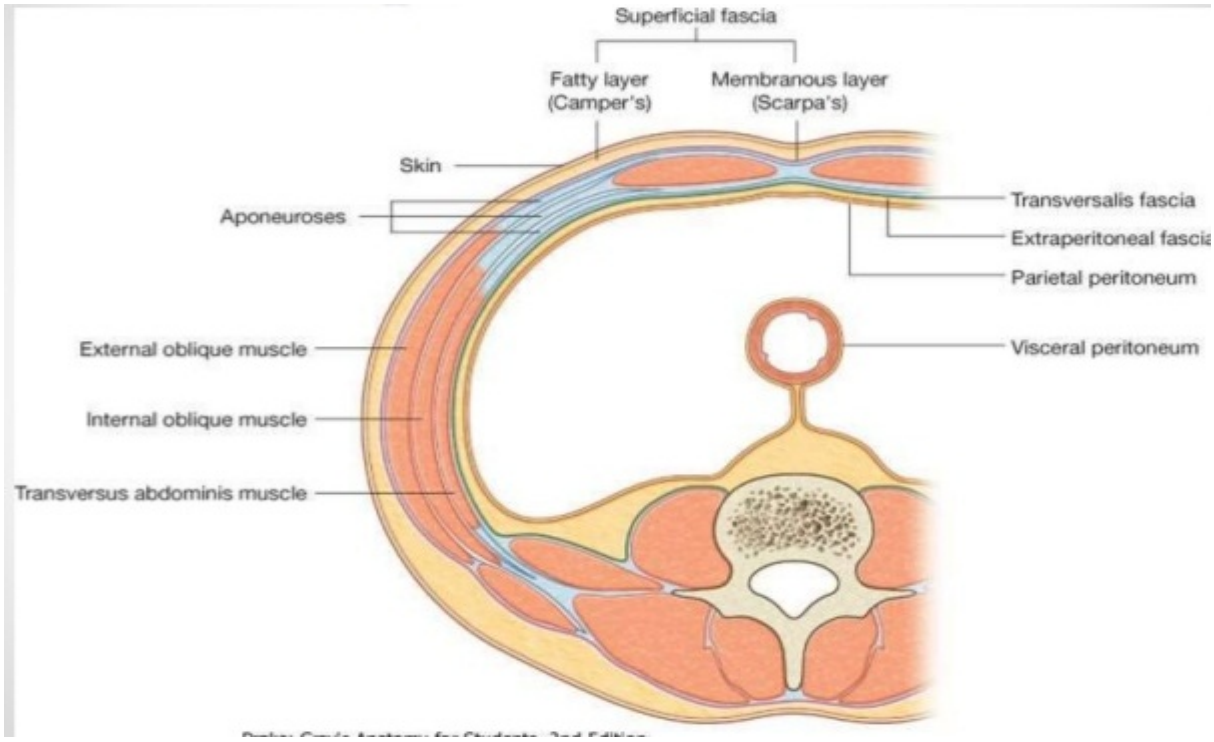
Broadly divided into, superficial intermediate and deep layers

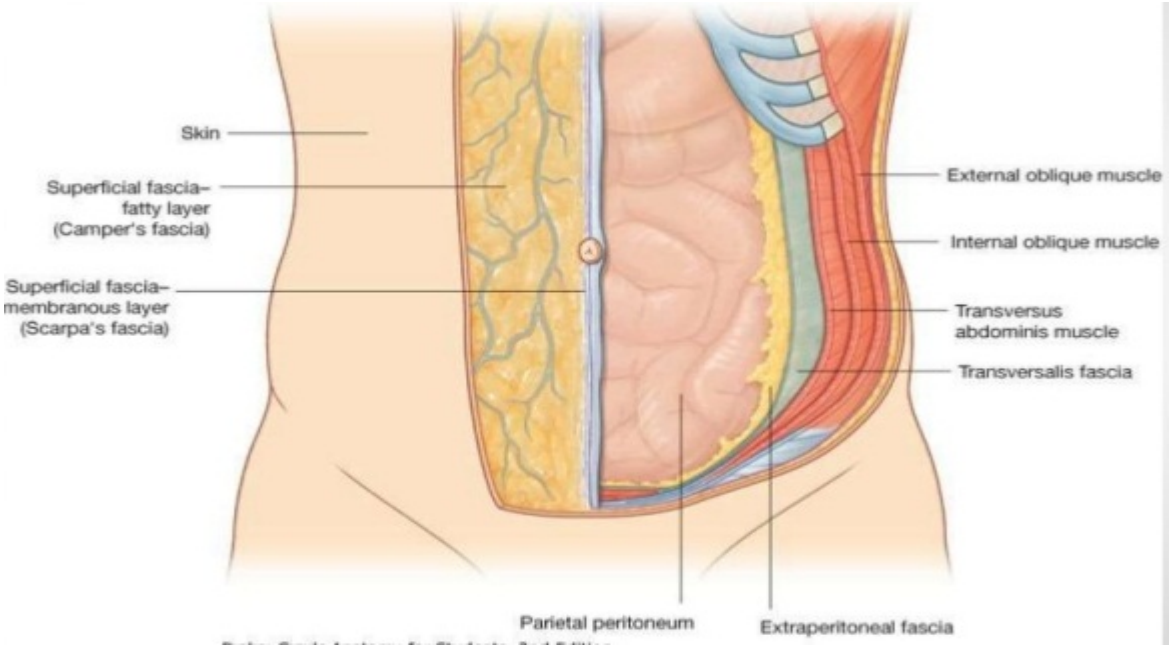
Skin and subcutaneous tissue

Second layers deep to skin, fascia superficialis

Fascia superficialis splits into two layers below umbilicus

- Outer Camper's
- Inner Scarpa's
- Camper's fascia, is the outer layer which consist of fat
- Scarpa's fascia is dense fibrous tissue which continues as fascia lata in thigh
- These fibro elastic structures posses rich vascular supply contributes to strengthening of abdominal wall
- Blood supply for fat superficial to Scarpa's fascia is from sub dermal plexus
- Subcutaneous tissue ,superficial to Scarpa's fascia is necessary for survival of overlying skin
- Fat deep to Scarpa's fascia can be removed during abdominoplasty

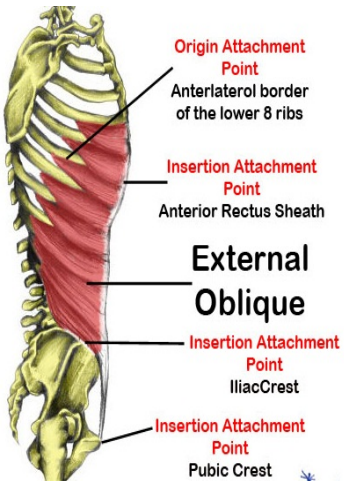

Superficial fascia
Fatty layer (Camper's)
Membranous layer (Scarpa's)
Skin
Aponeuroses
External oblique muscle
Internal oblique muscle
Transversus abdominis muscle
Transversalis fascia
Extraperitoneal fascia
Parietal peritoneum
Visceral peritoneum


Skin
Superficial fascia– fatty layer (Camper's fascia)
Superficial fascia– membranous layer (Scarpa's fascia)
External oblique muscle
Internal oblique muscle
Transversus abdominis muscle
Transversalis fascia
Parietal peritoneum
Extraperitoneal fascia

EXTERNAL OBLIQUE MUSCLE

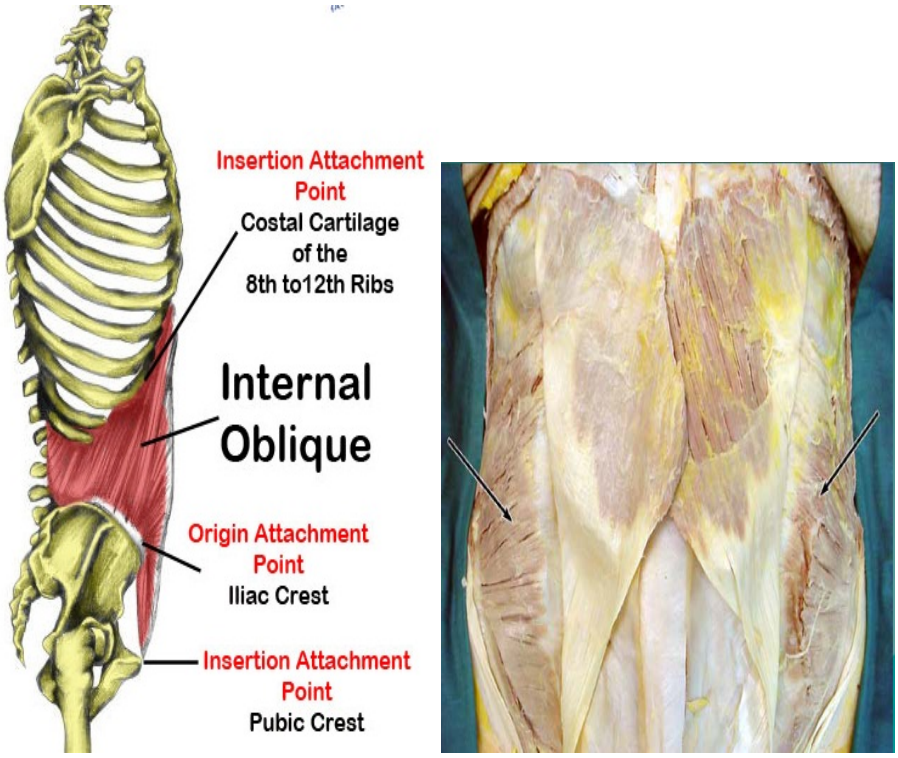
Intermediate layer of abdominal wall constituted by external oblique, internal oblique and transverses abdominis

- Originates from lower 8 ribs
- Posterior most fibres inserted into iliac crest
- At mid clavicular level, fibres inserted into linea alba
- Lower most fibres give rise to inguinal or Poupart's ligament
- It lies between ant sup iliac spine and pubic tubercle
- Direction of fibres is downwards and medially
- Blood supply by intercostals And deep circumflex iliac vessels
- Nerve supply by lower 6 thoracic nerves



INTERNAL OBLIQUE MUSCLE

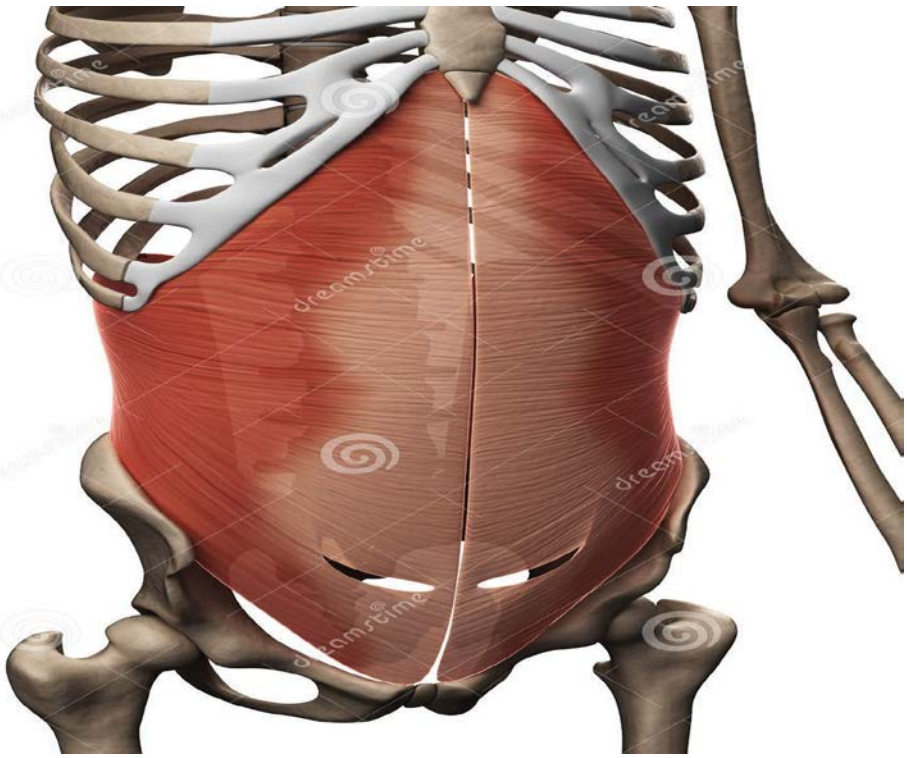
- Originates from iliopsoas fascia ,ant 2/3rd of the iliac crest and dorsolumbar fascia
- Uppermost fibres are inserted into lower 5 ribs and its cartilages
- Central fibres give rise to aponeurosis at the semicircular line
- Above semilunar line,it acts as a part of both anterior rectus sheath and posterior rectus sheath
- Below semicircular line it forms a part of anterior rectus sheath
- Lower fibres give rise to conjoint tendon along with fibres of tranversus abdominis (conjoint tendon seen in 5% population)
- Innervated by T7-T12



Internal oblique

TRANSVERSUS ABDOMINIS MUSCLE

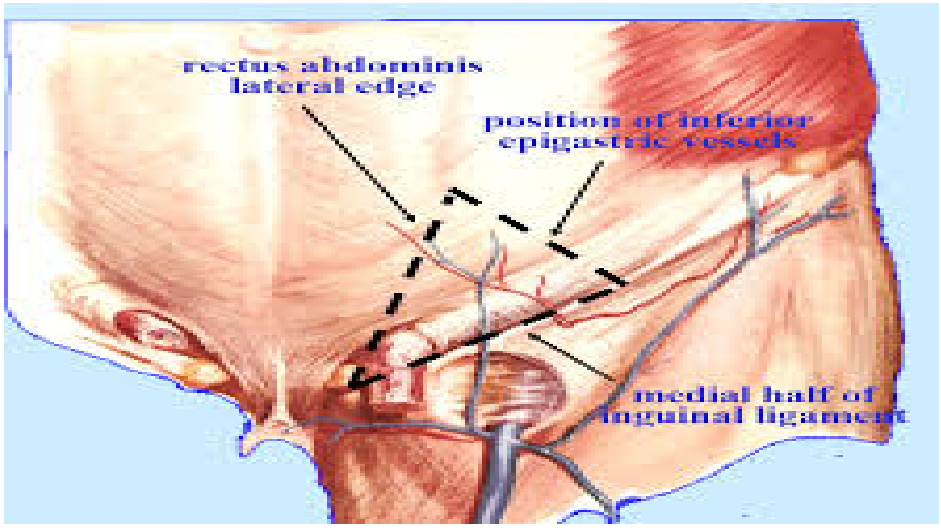
- Originates from the lower six cartilages, thoracolumbar fascia and lateral 2/3rd of inguinal ligament
- The spine of the lumbar vertebra, the iliac crest and iliopsoas fascia
- Inserted as a part of posterior rectus sheath above semicircular line
- And as a part of anterior rectus sheath below semicircular line
- Muscle fibres becomes aponeurotic Spigelian semicircular line
- In lower part of abdomen, it joins with internal oblique muscle to form conjoint tendon
- Supplied by T7-T11



HESSELBACH'S TRIANGLE

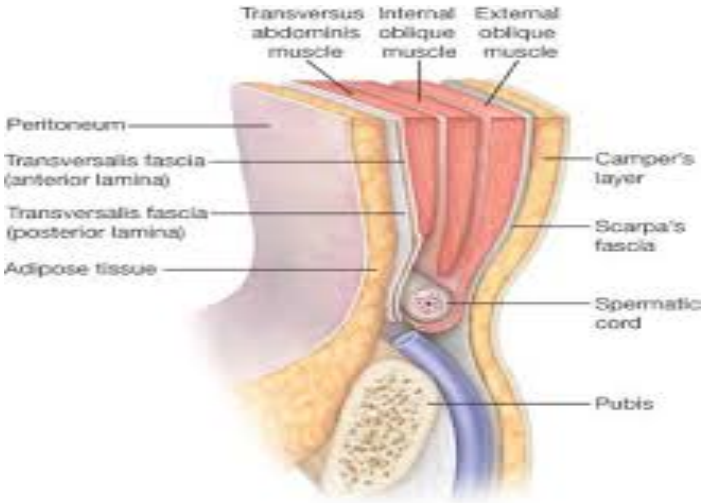
- Also known as inguinal triangle
- Area where, direct inguinal hernia extrude from posterior to anterior

- Bounded medially by lateral margin of rectus sheath
- Supero laterally by inferior epigastric artery
- Inferiorly by inguinal ligament
- Floor is given by transversalis fascia
- Hesselbach's fascia ,also knowns as cribriform fascia covers saphenous opening
- Hesselbech's ligament also known as inferior alveolar ligament ,is a thickening in transversalis fascia in relation to deep epigastric vessels



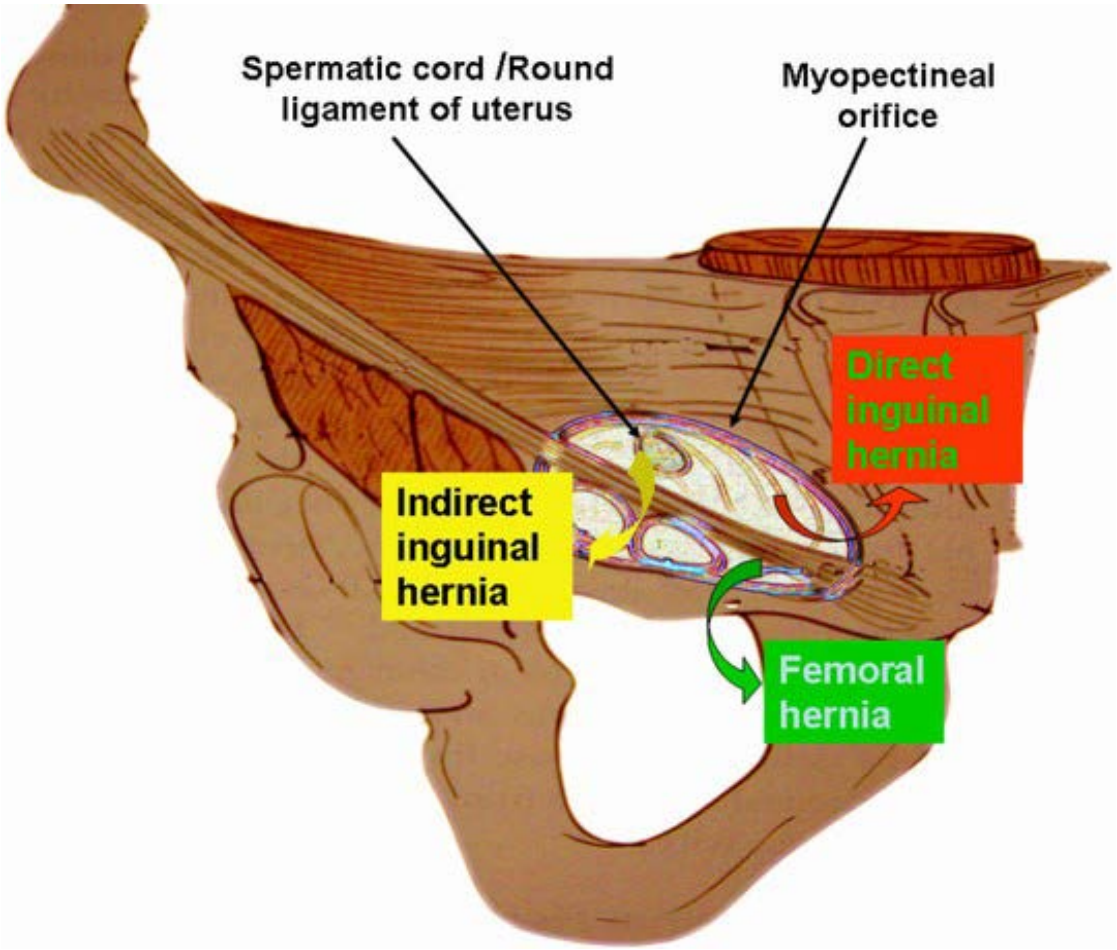
TRANSVERSALIS FASCIA

- Also called groin’s Achilles
- Aponeurotic membrane which lies inner to transverses abdominis muscle
- Continues with fascia lata,diaphragmatic fascia pelvic fascia
- Posteriorly merges with the fat covering on posterior surface of kidneys
- Inferiorly attached to iliac crest in its entire length and posterior margin of inguinal ligament
- Medial to femoral vessels, forms anterior wall of femoral sheath
- Beneath the inguinal ligament ,forms ilio pubic tract
- Opening in the transversalis fascia at the midpoint of inguinal ligament is the **deep inguinal ring**



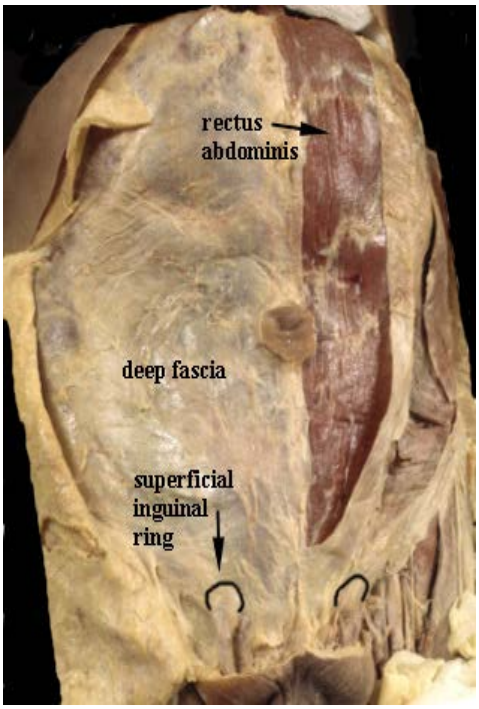
MYOPECTINEAL ORIFICE OF FRAUCHAUDS

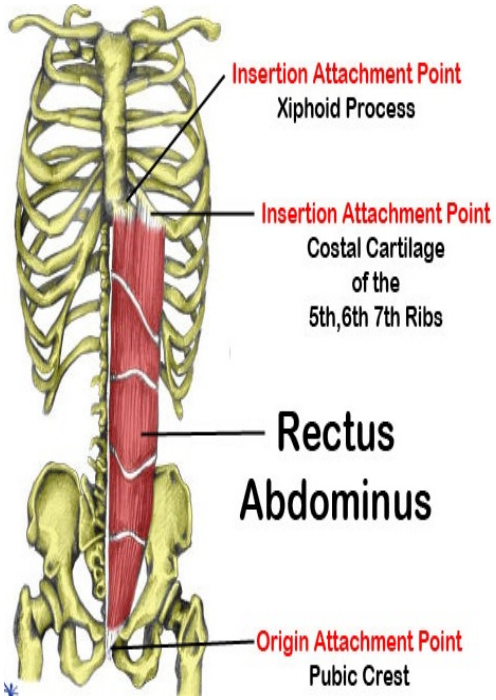
- Site for direct and indirect inguinal hernia
- An area of inherent weakness in pelvic region
- Bounded medially by central border of rectus abdominis muscle
- Laterally by ilio psoas muscle
- Superiorly by conjoint tendon
- Inferiorly by superior pubic ramus



RECTUS ABDOMINIS MUSCLE

- Originates from anterior surface of fifth, sixth and seventh costal cartilages and part of xiphoid
- Inserted into pubic crest and pubic symphysis. It has three to five tendinous insertions which attach to anterior rectus sheath
- There is no attachment to posterior rectus sheath
- Each rectus adjacent to each other is separated by linea alba
-





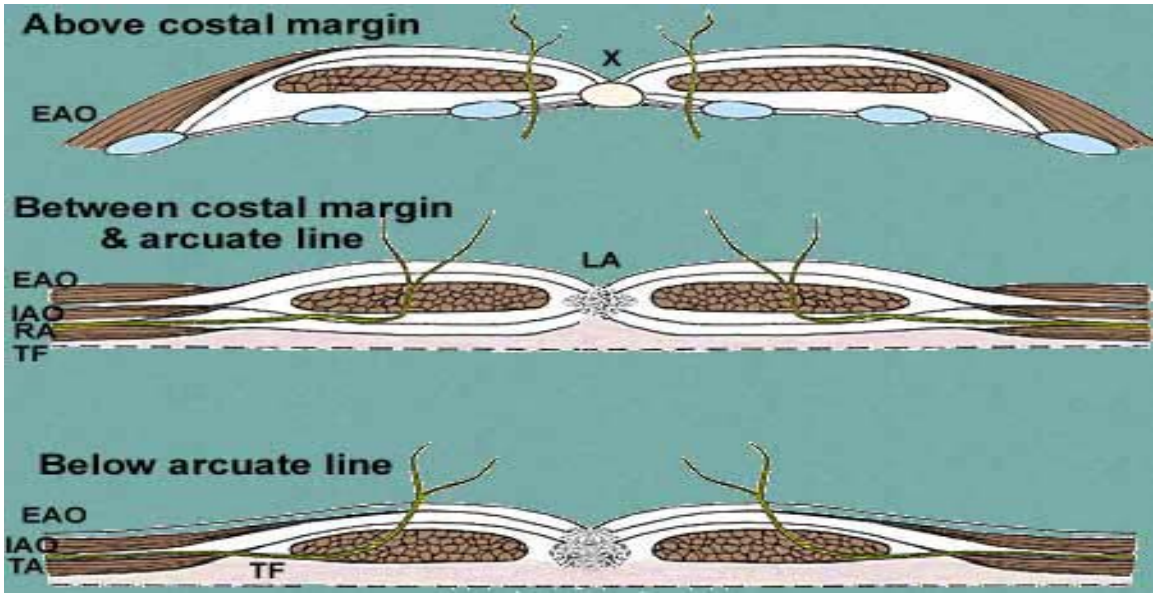
PYRAMIDALIS

- Lies in lower abdomen in anterior rectus sheath over rectus abdominis muscle
- Variable in nature
- Originates from pubic tubercle and pubic symphysis end in linae alba in midline in a region between umbilicus and pubic symphysis
- supplied by inferior epigatric artery and deep circumflex iliac artery
- its branches cross each other and other anastomosis takes place in midline which causes bleeding while making incisions
- nerve branches are coming from terminal subcostal nerve
- action of pyramidalis is uncertain

RECTUS SHEATH

Formed by the aponeurotic layers of oblique muscles and transverse abdominis. It contains rectus abdominis muscle and pyramidalis rectus muscle is covered by anterior and posterior rectus sheath above semicircular line arcuate line or semicircular line, lies at halfway distance from umbilicus and pubic crest at semi circular line, inferior epigastric vessels perforate rectus abdominis.

Here, anterior rectus sheath contains, external oblique aponeurosis and anterior lamina of internal oblique aponeurosis. Posterior lamina contains internal oblique and transverses abdominis aponeurosis below semicircular line, rectus is covered by anterior rectus sheath only, which contains aponeurosis of all three muscles above costal margin, rectus sheath is deficient posteriorly, muscles rest directly over cartilage



LINEA ALBA

In mid line ,a band of dense fibres called as linea alba, which joins two rectus muscles close to each other

Extends from xiphoid process to pubic symphysis

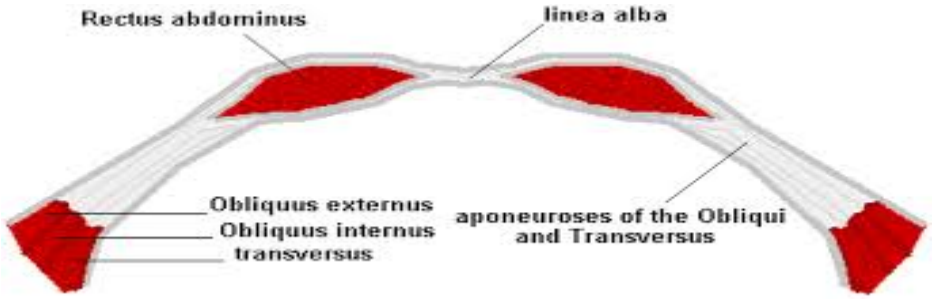
Contains dense collagen tissue

Minimal neurovascular structures

With pregnancy, strength of linea alba decreases

Ventral hernias occurs through weakened linea alba

Width varies from 1.5 -2cm



UMBILICUS

Physiological defect in linea alba

Surrounded by rectus sheath

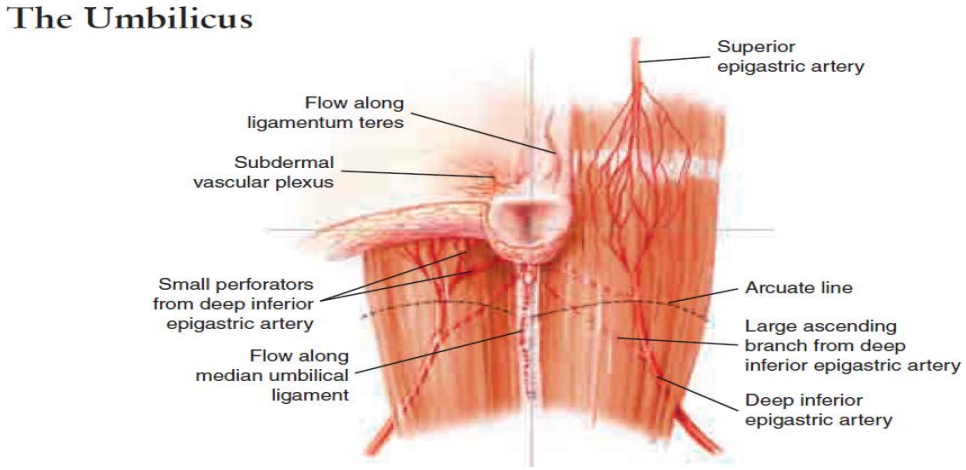
Lower 2/3rd of umbilicus constituted by fibro muscular tissues ,formed by fusion of urachus ,skin and 3 umbilical vessels

Upper 1/3rd formed by connective tissues, continuous with peritoneal tissues

Upper 1/3rd represents weakest area of umbilical ring

Blood supply for umbilicus is from subdermal plexuses , branches from right and left DIEA ,and median umbilical ligament

Stretching and descent of tissues around umbilicus after wight gain, alters the blood supply around umbilicus and careful dissection of umbilicus is needed

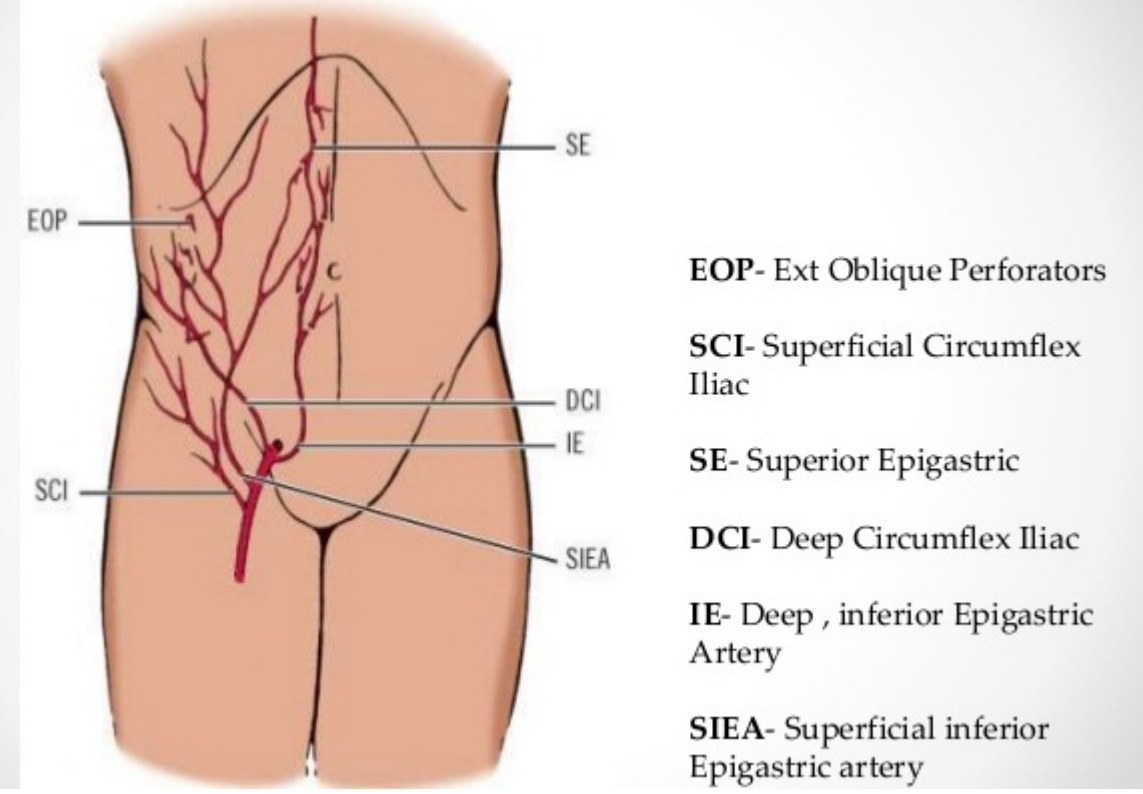


BLOOD SUPPLY OF ANTERIOR ABDOMINAL WALL

The anterolateral abdominal wall has blood supply from lumbar artery and last six intercostals artery, deep circumflex iliac artery, superior and inferior epigastric artery.

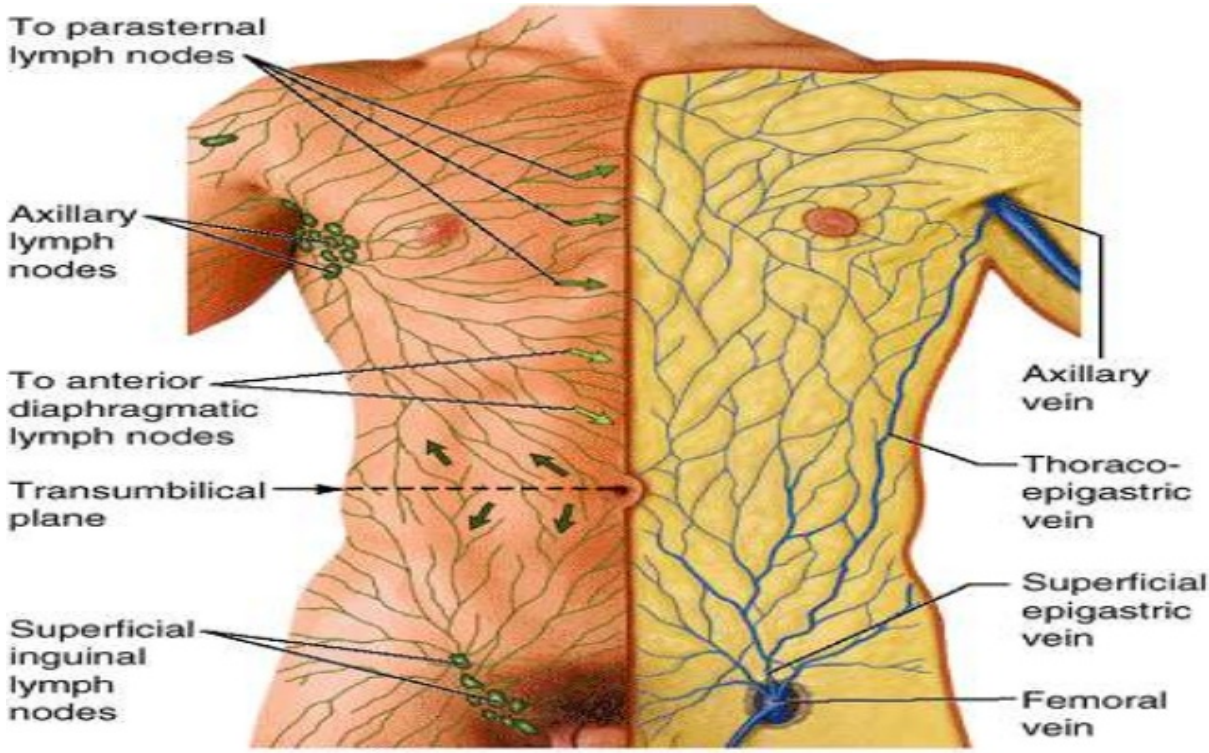
The lumbar and intercostals arteries together with ilioinguinal, iliohypogastric, intercostals nerve pass between internal oblique and transverse abdominis muscle. Finally at the midline it supplies rectus abdominis.

The deep circumflex artery arises from, the external iliac artery and supplies anterior abdominal wall musculature



VENOUS DRAINAGE

- Upper abdomen drains into superior venacava ,internal mammary ,intercostal and long thoracic veins.
- Below the umbilicus ,the abdomen drains intpo inferior venacava via ,superficial epigastric, circumflex iliac and pudendal vein
- Thoraco epigatric veins are longitudinal connection between lateral thoracic vein and superficial epigastric vein
- These veins provide, collateral route for venous return if caval obstruction occurs either above or below



Anterior view

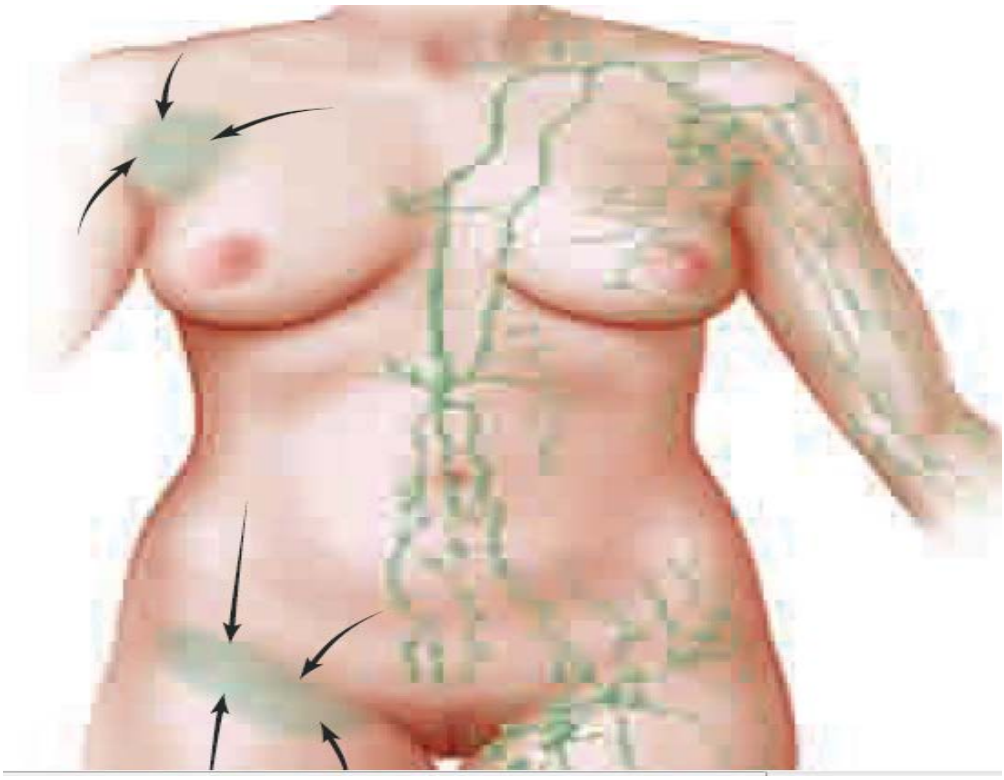
LYMPHATIC SUPPLY

Plexus of lymphatic vessels are present in supra Scarpal layer of fat

Lymphatic drainage is very important as it is associated with occurrence of oedema and serous fluid accumulation after surgery

Preservation of supra Scarpal layer of fat is important to avoid these complications

- Above umbilicus anterior abdominal wall lymphatics reach axillary group of lymph nodes
- Abdominal wall, below the umbilicus drains into superficial inguinal nodes



COTINENCE MECHANISM OF ABDOMINAL WALL

- All muscles in abdominal wall are covered by homogenous tissue
- Myo fascial complex adjust to the change in intra abdominal ressure
- Non deformable structures like bone and cartilages acts as anchorages
- Fascial areas are flexible
- Non contractile structures of abdominal wall increases thrust, as intra abdominal pressure increases
- Abdominal tension or intra abdominal pressure is regulated by Law of Laplace
- Transversalis fascia provides cushioning effect, and distributes pressure equal in all directions
- Synergistic work of fascia and muscles maintains anti gravitational position and movements of trunk and pelvis

NERVE SUPPLY

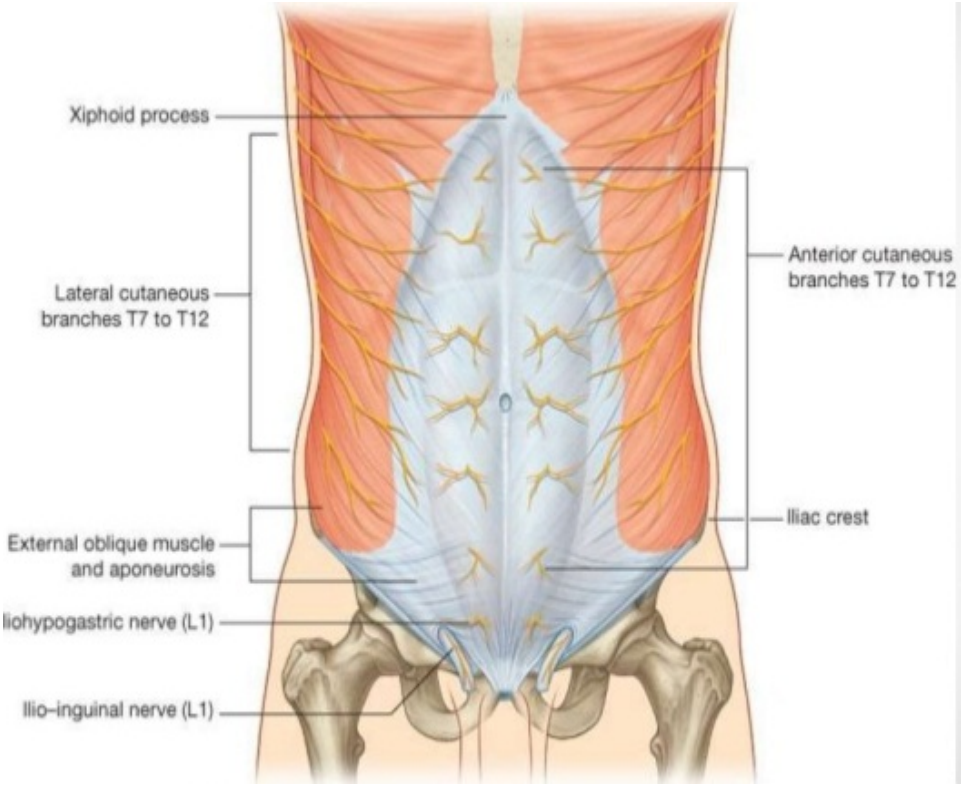
Anterior abdominal wall innervated by 7-12 thoracic nerve

Motor supply by seventh and eighth thoracic nerve

Ilio inguinal and ilio hypogastric nerve supplies the sensory innervations to hypo gastrium and lower abdominal wall

Neuro vascular bundle passes between internal oblique and transverses abdominis muscle

No neuro vascular bundles between external and internal oblique muscles



VENTRAL HERNIAS

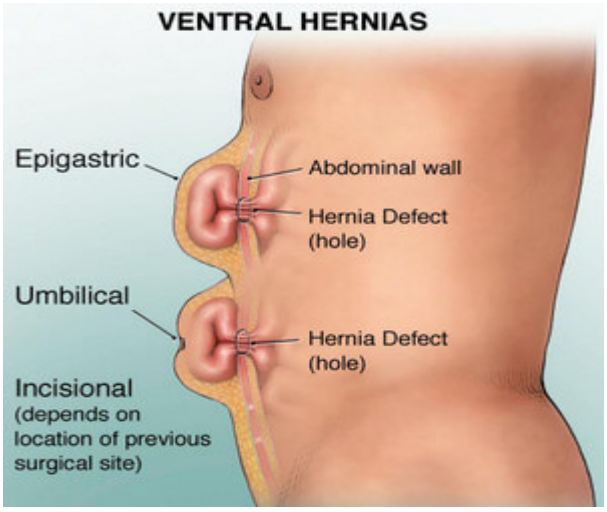
- Hernia is an abnormal protrusion of viscous of part of it through the wall containing it
- Abdominal wall hernias include both inguinal and ventral hernias

CLASSIFICATION VENTRAL HERNIAS

CONGENITAL

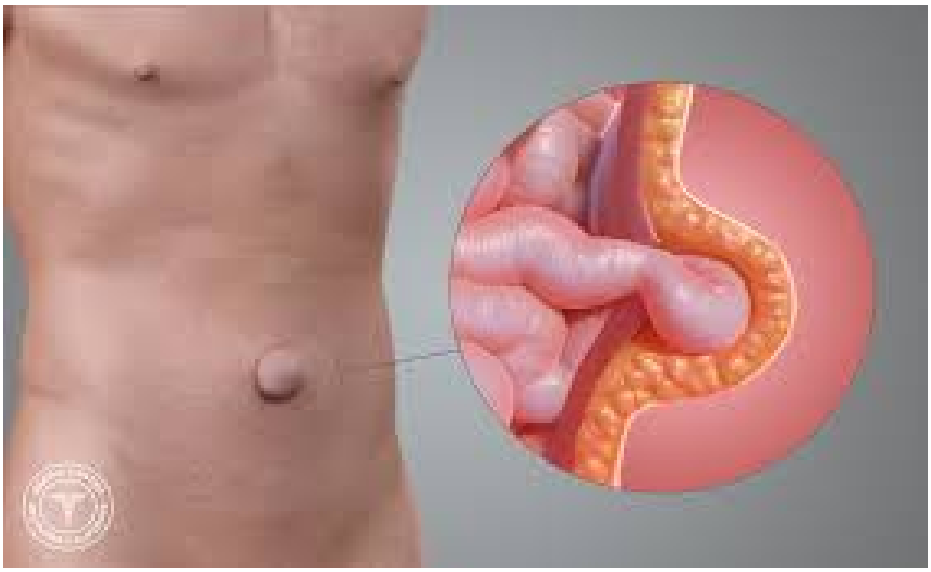
ACQUIRED

- Umbilical
- Paraumbilical
- Epigastric
- Incisional



UMBILICAL HERNIA

- Can be congenital or acquired
- More common in males
- In infants and children, neonatal sepsis is a causative factor
- If it persists after 2 yrs or size more than 2cm ,is an indication for surgery in children
- Commonly seen in premature babies
- But usually closes by one year
- In adults it arises due increased intra abdominal pressure like weight lifting, and chronic cough



PARAUMBILICAL HERNIA

- Protrusion of the contents around umbilicus
- More common in females
- Enlarges ovally and often sags downwards
- Neck usually narrow
- High tendency for adhesion, irreducibilty and obstruction
- Mayo ‘s operation with or without umbilicectomy can be done for small defects
- Infections and recurrences are common even after surgical procedures

EPIGASTRIC HERNIA

- Here, in the epigastric region, intra abdominal contents are protruded causing pain and other symptoms
- Higher chances for having multiple defects
- Deccusation of fibres of linea alba between xiphiod and umbilicus
- Weakness of the anterior abdominal wall is the main cause along with activities causing rise in intra abdominal pressure
- Common among muscular men and manual labourers

INCISIONAL HERNIA

Protrusion of visceral contents through old surgical or traumatic scar is called incisional hernia

Common in old age and obese individuals

Here primary mechanism is defective wound healing and weakness of abdominal wall especially at the site of scar tissue

Common in lower abdomen

Size is important for selecting surgical technique

Various studies have shown, factors like

- Old age
- Female gender
- Nature of surgery (emergency /elective)
- Wound infection, seroma formation
- Systemic illness like anaemia T2DM
- Obesity, poor nutritional status
- Defective closure techniques
- Post op infections Contributes to the development of incisional hernia

Defects can be

Small (less than 2cm)

Large and wide (more than 2cm)

Very large

Multiple

GOALS OF HERNIA REPAIR IN GENERAL

- Dynamic muscular support
- Prevention of viscera coming out
- Restoration of abdominal wall in tension free manner
- Older days , hernia defects were closed by tissue repairing techniques. At first it was simply en mass closure after reducing the contents. Then with the knowledge of anatomy ,different techniques were evolved .In 1950 prolene mesh was first introduced for hernia repair. Currently mesh repair is the standard procedure for medium to large defects. But mesh extrusion and infections remains the problem. Different studies have shown mesh infection up to 10%

TYPES OF MESH

- Synthetic mesh
- Non absorbable polypropylene, polythene, polyester ,PTFE

  Absorbable Vicryl

  Biological mesh Alloderm

TYPES OF MESH REPAIR

- Onlay
- Inlay
- Sublay Between visceral peritoneum and anterior abdominal wall
- Underlay Intra peritoneal mesh implantation

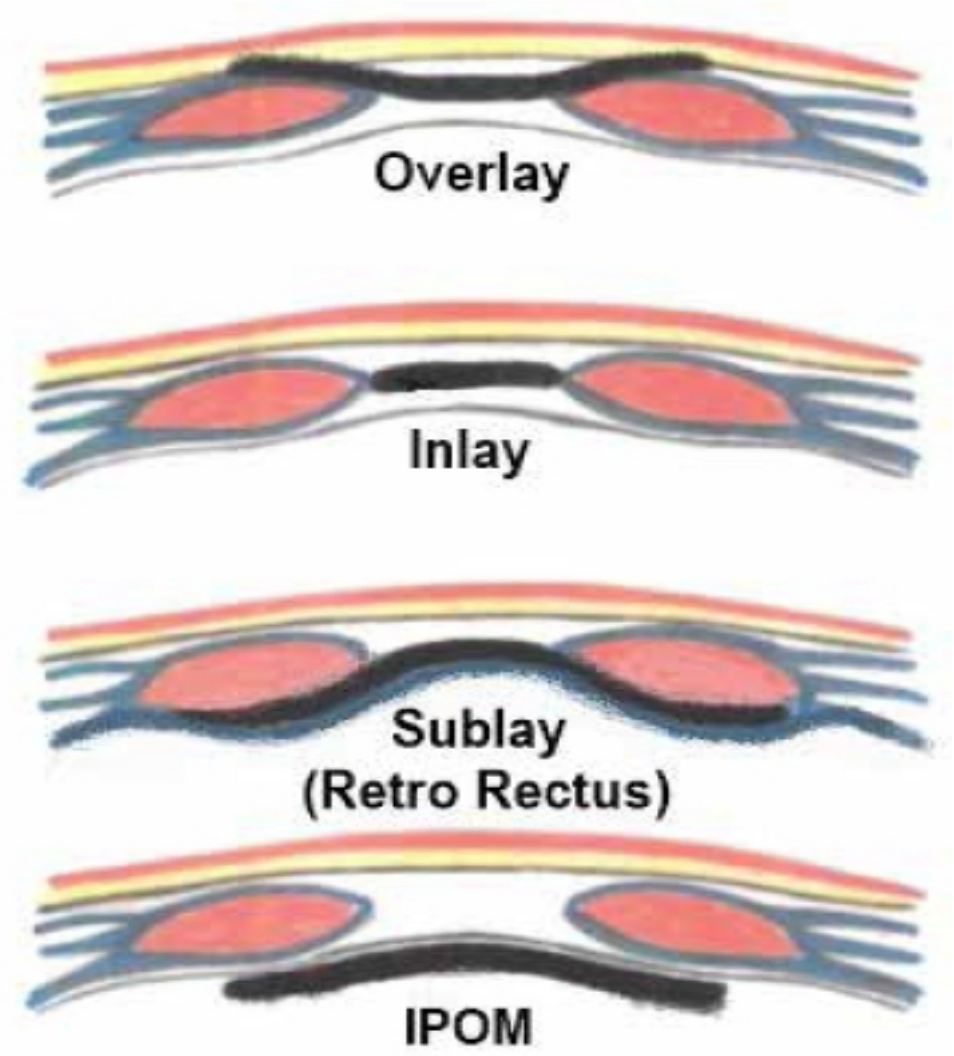


Figure 2. Nomenclature of mesh position

ABDOMINOPLASTY

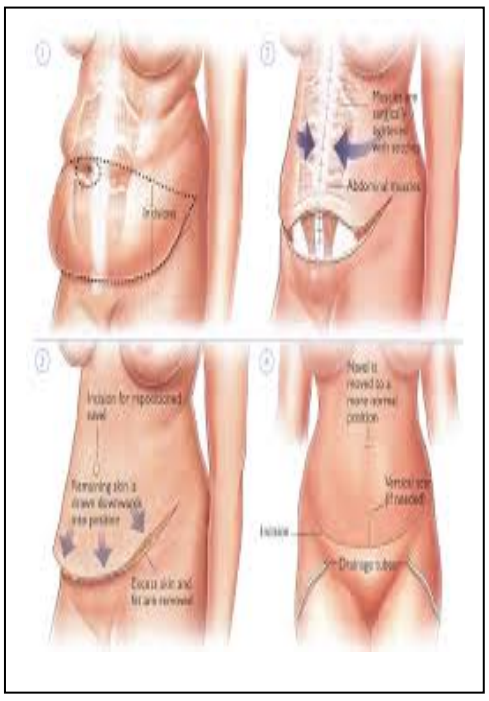
Abdominoplasty is a truncal rejuvenation and recountoring process in which excess of skin and subcutaneous fat is removed and abdominal wall is tightened .Simple removal of excess skin and subcutaneous tissue is known dermolipectomy .Abdominoplasty were first done by surgeons who were operating on umbilical hernia , found excess of skin and subcutaneous tissue causing problem and removed it. Fortunately, it improved the contour of abdomen in those patients and , results attracted new patients without hernia to undergo dermo lipectomy. It was also known as TUMMY TUCK operation and still being used. Then various methods and incisions came with the advancement of plastic surgery techniques. There are different types of classification based on the extent and types

BASED ON EXTENT

- Mini
- Complete

BASED ON INCISION

- Vertical
- Horizontal



- Combined

Types and incisions are tailored according to patients nature of anterior abdominal wall, location of excess fat, and strength of abdominal musculature. The aim of abdominplasty is to remove maximum amount of excess skin and fat with minimal scar/scars at invisible sites as it a cosmetic procedure. Previously only abdominoplasty with dermolipectomy was only available for patients who were undergoing body countouring procedure .Liposuction came to scene in late 1980s. The spectrum of procedures available for body contouring included, liposuction alone, liposuction combined with abdominoplasy, liposuction followed by abdominoplasty as a staged procedure

Matassaro and colleagues classified abdominoplasty procedures into 4 types based on skin laxity, amount of fat, and state of musculo aponeuroticsystem

Type 1 advised suction assisted lipectomy alone

Type 2 advised mini abdominoplasty

Type 3 complete abdominoplasty

Type 4 liposuction followed by complete abdominoplasty

ABDOMINOPLASTY AS A COMBINED PROCEDURE ALONG WITH MESH REPAIR FOR VENTRAL HERNIAS

Even though abdominoplasty was done as a subsidiary procedure during umbilical hernia repair, way back in 1900, the two techniques evolved as separate entities for decades. The idea of combining abdominoplasty is a novel one. Surgeons on various parts of the world are doing it and results are encouraging .Even though it is not proved a s the BEST ONE ,its efficacy in terms of recurrence is same as that of any hernia repair alone and better compared to cosmetic out come

For my study, I took two papers as index articles

1 By Wagih Mommtaz Ghnnam

2 By Adel Tolba et al

In these two papers, they studied the advantages and disadvantages of combining ventral hernia repair with abdominoplasty

AIMS AND OBJECTIVES

To assess and compare the efficacy of mesh repair with abdominoplsty, with simple mesh repair in terms of

- Duration of surgery
- Ambulation
- Surgical site infections
- Drain output
- Flap necrosis
- Change in abdominal girth
- Duration in hospital stay
- Recurrence

MATERIALS AND METHODS

TITLE

COMPARATIVE STUDY OF MESH REPAIR AND MESH REPAIR WITH ABDOMINOPLASTY FOR VENTRAL HERNIAS

SOURCES OF DATA

Patients admitted at GMKMC Salem with ventral hernia

INCLUSION CRITERIA

All patients who present in the surgical outpatient department with ventral hernia based on history and on clinical examination

EXCLUSION CRITERIA

- Defects less than 2cm
- Children
- Pregnant ladies
- Morbid obesity (BMI more than 40)
- Complicated hernia

STUDY DESIGN

Prospective study

STUDY PERIOD

2 years

PLACE OF STUDY

Government Mohan Kumara Mangalam Medical college Hospital, SALEM

Tamil Nadu

SAMPLE SIZE

60 patients

ETHICAL COMMITTEE CLEARANCE

Obtained from Institutional Ethical Committee

STUDY METHODOLOGY

In this study , from patients who met inclusion and exclusion criteria ,formal written consent was obtained

In pro forma history, clinical examination such as signs and symptoms were recorded

All patients were underwent the following investigations

- Blood glucose urea creatinine
- Complete blood count
- Urine routine examination
- X ray chest PA
- X ray abdomen erect and lateral
- USG of abdomen and pelvis
- CT abdomen if need

Patients ,after getting informed written consent ,were allocated in two groups and one group under went mesh repair alone and another group underwent mesh repair with abdominoplasty

SURGICAL TECHNIQUE

MESH REPAIR ALONE

Informed written consent is obtained mentioning procedure, anaesthesia , complications of anaesthesia and surgery, post op dietary and life style modifications ,self care and expected results

After GA/SA patient in supine position parts were painted and draped

Incision made as per the size and site of hernia in anterior abdominal wall

Pre op antibiotics were given before induction of anaesthesia

For epigastric hernia upper vertical midline incision is made

For umbilical and para umbilical hernias middle midline vertical incisions or smiley incision were made depending upon the size of hernia

In incisional hernias incision were made around old scar tissue and scar was excised

Cutaneous flap raised

If small sac ,sac is reduced

If larger sac ,sac is excised and contents reduced

Adequate space is created beneath the flap for keeping mesh

Complete haemostasis is achieved

Defect size is measured and rectus is approximated. The prolene mesh is kept over the anterior rectus sheath

Lateral extension of mesh is 5cm from the defect and fixed with anterior rectus using 2-0 non absorbable material like prolene

Suction drain is kept in subcutaneous plane to prevent seroma formation and promotes fibrotic changes

Finally wound is closed layer by layer

Dressing applied

Shifted to post op ward after recovering from GA/spinal

Encouraged to mobilize as early as possible

Drain collection noted each day

Drain removed if collection is less than 10 ml per day for two consecutive days

Daily dressing is applied

Laxatives are given to avoid constipation

Signs of wound infection ,flap necrosis etc are noted

Advised to avoid weight lifting and straining

Abdominal binder applied

Patient can considered for discharge once the drain is removed

Once discharged, advised to take analgesics, to keep wound site clean ,and to wear abdominal binder, and dietary measures for weight reduction and to avoid constipation, laxatives and stool softeners are given in selected patients

- Reviewed after one month post op
- Abdominal girth noted at this time
- Patient can resume their normal work, but advised to avoid lifting heavy weights and straining
- advised to wear abdominal binder for 3 months
- Again advised to review after 6 months for recurrence

MESH REPAIR WITH ABDOMINOPLASTY

Pre operatively, patient is counselled in detail regarding the nature of surgery, its complications and expected cosmetic outcomes. Patient should have realistic idea after the counselling regarding the ‘cosmetic factor’ outcome

GA/RA given

Patient in supine position

parts are painted and draped

Incision made in the lower abdomen (Transverse Gull Wing incision)

Incision deepened

Flaps raised

Flaps raised up to costal margin

Hernia defect and sacs identified

Sacs reduced from adhesions , excised /reduced along with the contents

Defect approximated and sutured with 2-zero prolene, (interrupted sutures)

Placation of aponeurotic system is done using prolene

Now mesh is kept and fixed

Lower end of the upper flap is pull down and skin and excess subcutaneous tissue to be removed is assessed

Position of umbilicus is noted

If large amount of tissue to be removed from lower region of upper flap position umbilicus will come down

In those cases umbilicus transposition is done

For umbilical transposition, 0.5cm incision is made around umbilicus with umbilicus stalk intact

New site is marked and defect is, made., transposed umbilicus sutured to new defect layer by layers

Old defect of umbilicus, in upper flap may be either going with excess skin or can be closed

In umbilical and para umbilical hernias, neo umbilicoplasty is considered

If adequate cosmesis is not possible ,neo umbilicoplasty can be considered later

Lower and upper flaps are approximated after keeping drain

Wound closed in layers

Post op care and follow up are same for both types

PREOP PICTURES

- After getting informed written consent ,and allocating the patient to either group ,pre op pictures and measurements are taken
- Position of umbilicus is noted
- BMI , abdominal girth etc are noted
- Abdominal girth is noted at site with maximum girth from waist to xiphoid, and the site is noted down as length from xiphod for future reference
- Girth over the hernia to operated is also noted

- It is advisable to take pre op pictures from frontal view ,from left and right sides
- Pre op, post op comparison is useful to make decisions like incisions to be made in similar cases in future
- Pictures like patient in sitting position, patient with stooping over position can also be taken. A detailed discussion regarding expected cosmetic out come with the patient is desirable
- All these pictures will give an idea regarding, redundant skin and subcutaneous tissue over abdominal wall, relative position of umbilicus
- Markings are done prior day to surgery

Hernia defect is demarcated with skin marker pre operatively in standing position and supine position

On table, the incision is marked after cleaning and draping

Amount of tissue to be removed also marked

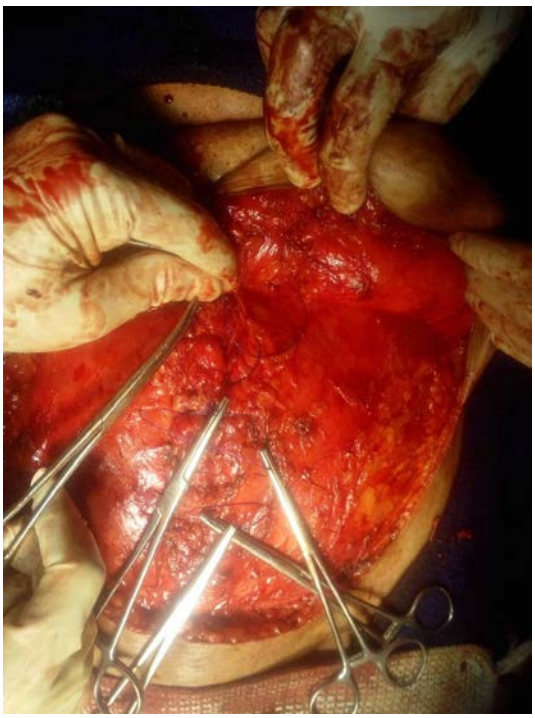
Here in this case incision is made 2 inch above pubic symphysis

Incision is deepened ,using electro cautery through outer Camper's and inner Scarpa's fascia

Subcutaneous veins and arteries are cauterized to achieve haemostasis

For mesh repair with abdominoplasty procedure ,same incision is made for all cases irrespective of type and site of hernia

For conventional method , different incisions are made according to site and type of hernia



Subcutaneous flap raised upto xiphoid process

Plane is below the Scarpa's fascia, or above musculo aponeurotic structures

Care is taken while dissecting around sac and umbilicus to maintain vascular supply

Sac is identified ,contents reduced and sac transfixed

Defect is closed with prolene. strengthening of abdominal muscles by placation using non absorbable suture material is done

Here, as a lot of tissue to be removed below umbilicus , position of umbilicus will be changed. So umbilical transposition has to be done. Around 5mm marked around umbilicus and separated from surrounding tissue

Excess tissue is removed below umbilicus

Haemostasis achieved

Umbilical transposition is completed .Fixed at 3,6,9&12 O clock positions with prolene and subcutaneously with vicryl, circumferentially

Mesh is placed and secured with prolene

Drain is kept and fixed

Wound is closed in layers. Duration of surgery noted (skin to skin)

Sterile dressing applied with tight bandage

POST OP DAY 3 POST OP DAY 5

Post operatively , after recovery from anaesthesia patient shifted to ward

Allowed to mobilize as early as possible. Early mobilisation, decreases chance for post op complications like DVT ,and lung infections

But, due to pain sometimes patient may delay ambulation

Adequate post op analgesia is important

Drain is measured daily, also watched for wound infections

Daily sterile dressing is applied

POST OP DAY 10

Once the drain is less than 10 ml for two consecutive days ,DT removal can be considered .(Some articles advise drain removal once the drain becomes less than 50 ml, but here in order to avoid seroma formation, this protocol is followed)

At this stage patient can be considered for discharge if no other complications or contraindications

Patient advised to review for suture removal and after one month

At one month, change in abdominal girth is noted

POST OPERATIVELY AFTER SIX MONTHS

Patient is asked to wear abdominal binder, avoid straining at stools ,and avoid lifting heavy weights and watch for recurrence

Can resume normal work after one month

Advised maintain ideal body weight according to BMI, by maintaining dietary and exercise regime

Reviewed after 6 months for recurrence

OBSERVATIONS AND RESULTS

The parameters to be compared are tabulated .The data are expressed in the form of means and Percentages

- Duration of surger expressed in minutes
- Ambulation after surgery expressed in hours
- Drain collection average drain collection per day in ml at the discharge. Suppose patient 50ml on D1,30ml on D2 20ml each on D3 and D4 ,10ml on D5 average (50+30+20+20+10) /5 =26 ml day
- Number of days drain kept in days
- Surgical site infections expressed in percentage
- Flap necrosis expressed in percentage of flap necrosis in total number of patients
- Recurrence expressed in %

- Change in abdominal girth: expressed in percentage change

Pre op abdominal girth 86cm

Post op abdominal girth 76cm

Change 8cm

% 8/86=9

Post op abdominal girth is measured after one month post operatively

- Duration of stay in hospital : expressed in days

Data are tested using STATISTICAL TESTS OF SIGNIFICANCE

From mean value standard deviation (SD) found and, standard error(SE) of difference between two means found

Standard deviation : $\sqrt{}$ sumof $(X\text{-mean})^2/n$

S. E of difference between two means : $\sqrt{}sd1^2/n_1 + (sd2)2/n_2$

Sd1 standard deviation of first group

Sd2 standard deviation of second group

n1 total number in fisrt group

n 2 total number in second group

for values expressed as percentages and proportion standard error of difference of two proportions used

IF ACTUAL DIFFENCE BETWEEN TWO MEANS IS GREATER THAN TWICE SE BEWTWEEN THOSE TWO MEANS ,THE DIFFENCE IS SAID TO BE SIGNIFICANT

Suppose we are testing the average duration of surgeries ,without abdominoplasty and with abdominoplasty

	Number	Mean duration	SD
Without abdominoplasty	12	70min	10.2
With abdominoplasty	12	80min	24.4

SE $\sqrt{(10.2)^2/12+(24.1)^2/12}=7.5$

SE 7.5. actual difference 10

From this we can conclude that there is no statistical significance between two techniques in terms of time consumed

S E of difference between two proportions $\sqrt{P_1q_1/n_1+p_2q_2/n_2}$

p proportion

n number

IF ACTUAL DIFFENCE BETWEEN TWO PROPORTIONS IS GREATER THAN TWICE SE BEWTWEEN THOSE TWO PROPORTIONS ,THE DIFFENCE IS SAID TO BE SIGNIFICANT

TYPE OF HERNIA		MESH REPAIR ALONE	%	MESH REPAIR WITH ABDOMINOPLSTY	%
UMBILICAL	8	5	62	3	38
PARAUMBILICAL	8	5	62	3	38
INCISIONAL	39	17	44	22	66
EPIGASTRIC	5	3	60	2	40
TOTAL	60	30		30	

DURATION OF SURGERY

There are higher chances for morbidity and mortality associated with prolonged duration of surgery

As we are combining two surgical techniques in a single sitting , it is logical that average time taken for surgeries with abdominoplasty would increase

Time taken from skin incision to closure is considered as duration of surgery

If much significant increase in duration of surgery, it will affect patients chances for intra op complications , recovery from anaesthesia, and post op complications like pulmonary atelectasis, pulmonary infections, aspiration due to impaired gag reflex and DVT, and in turn prolongs the stay in hospital

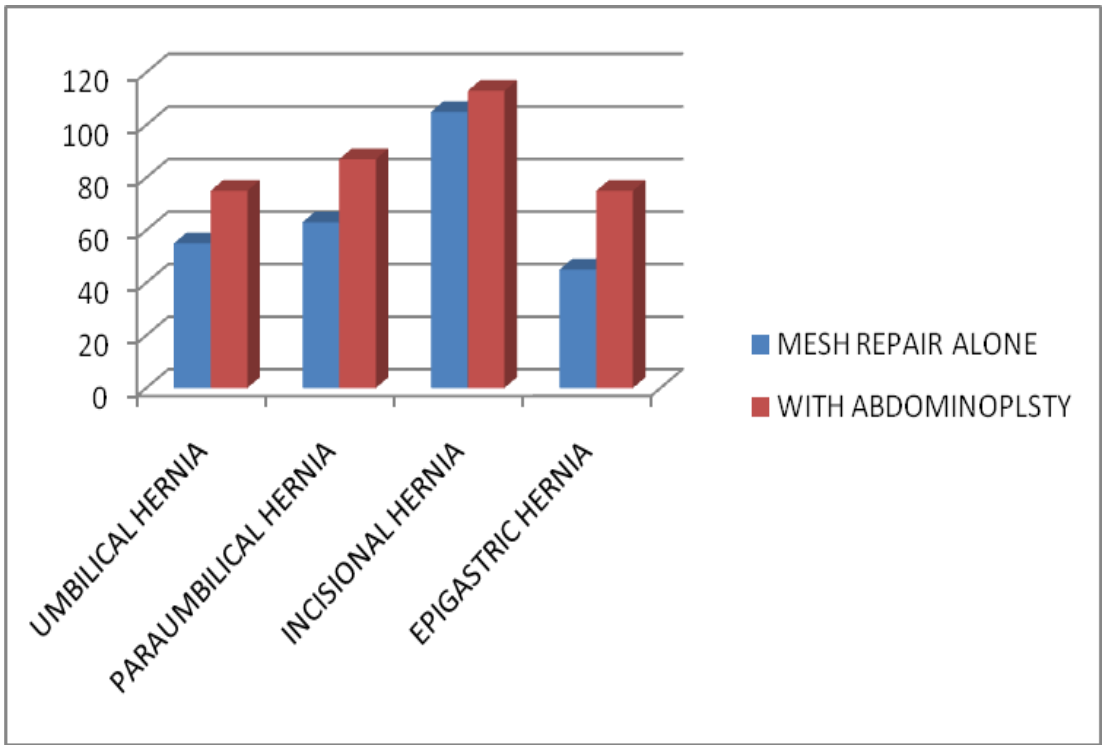
Again prolonged duration is problematic in patients with systemic diseases like T2DM,Hypertension ,CAD

Here we are expressing time taken for different surgeries in minutes and finding whether any statistically significant difference exists

Mean duration of surgery is deducted and standard deviation is found for both groups for different types of ventral hernias

Standard error of difference between two means is found

	Mesh repair alone			Mesh repair with abdominoplasty			SE of means	sig
		Mean	sd		mean	sd		
UMBILICAL HERNIA	5	55	6.3	3	75	4.8	3.9	yes
PARAUMBILICAL HERNIA	5	63	2.7	3	87	5	4.26	yes
INCISIONAL HERNIA	17	105	14	22	113	13	4.3	NO
EPIGASTRIC HERNIA	3	45	10	2	75	10	9.1	yes



DURATION OF SURGERY

AVERAGE DURATION FOR AMBULATION AFTER SURGERY

For reducing post op complications like pulmonary embolism, DVT early ambulation after surgery is advised

If ambulation is not possible, mobilisation of limbs through active and passive movements is advocated

Walking is the best mode as it increases circulation

But pain and delayed recovery from anaesthesia, may prolong time taken for ambulation

Here in abdominoplasty we are excising tissues and more chances for post op pain which in turn may affect the mobilisation of patient

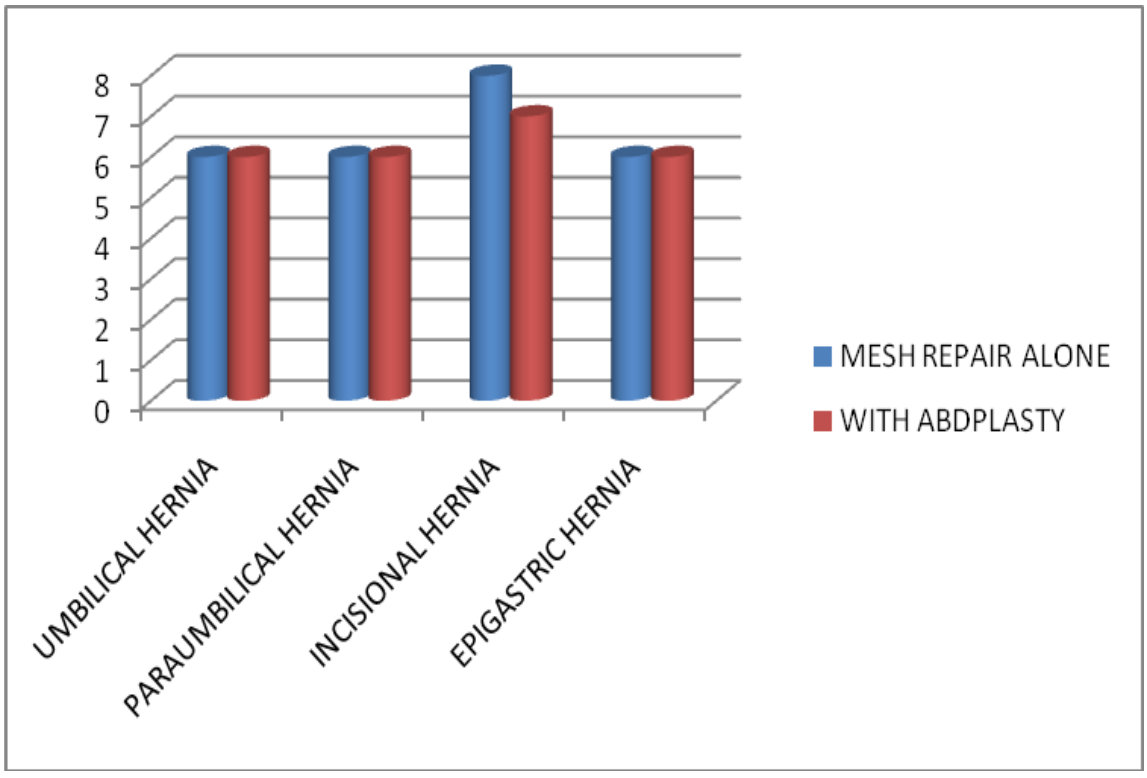
Vigorous ambulation is not advised as it can interfere with wound healing ,only moderate ambulation is advised ,that too here in our cases with abdominal support

Here we are trying to find out whether , difference in surgical techniques affects prolongation of bed rest

Time expressed is given in hours after surgery

AVERAGE HOURS FOR AMBULATION AFTER SURGERY

	Mesh alone			With abdominoplsty				
	nos	MEAN	SD	nos	MEAN	SD	SE	SIG
UMBILICAL	5	6	0.8	3	6	0.8	.57	NO
PARAUMBILICAL	5	6	0.8	3	6	1.15	0.4	NO
INCISIONAL	17	8	1.5	22	7	1.06	0.39	YES
EPIGASTRIC	3	6	0.8	2	6	0.5	0.6	NO



SURGICAL SITE INFECTIONS

One of the commonest complication after surgery

It can be minor wound infections like, infected serous discharge, or major infections and deep infections with pus discharge

SOUTHAMPTONS wound grading system used for assessing healing and infections

Here , as more amount of tissue is mobilised compared to the other technique theoretical chance for higher post operative infections exist

Percentage of patients with infections are found out in each group

SOUTHAMPTONS WOUND GRADING SYSTEM for healing and infection

GRADE 0 Normal healing

GRADE 1 with bruising /mild oedema

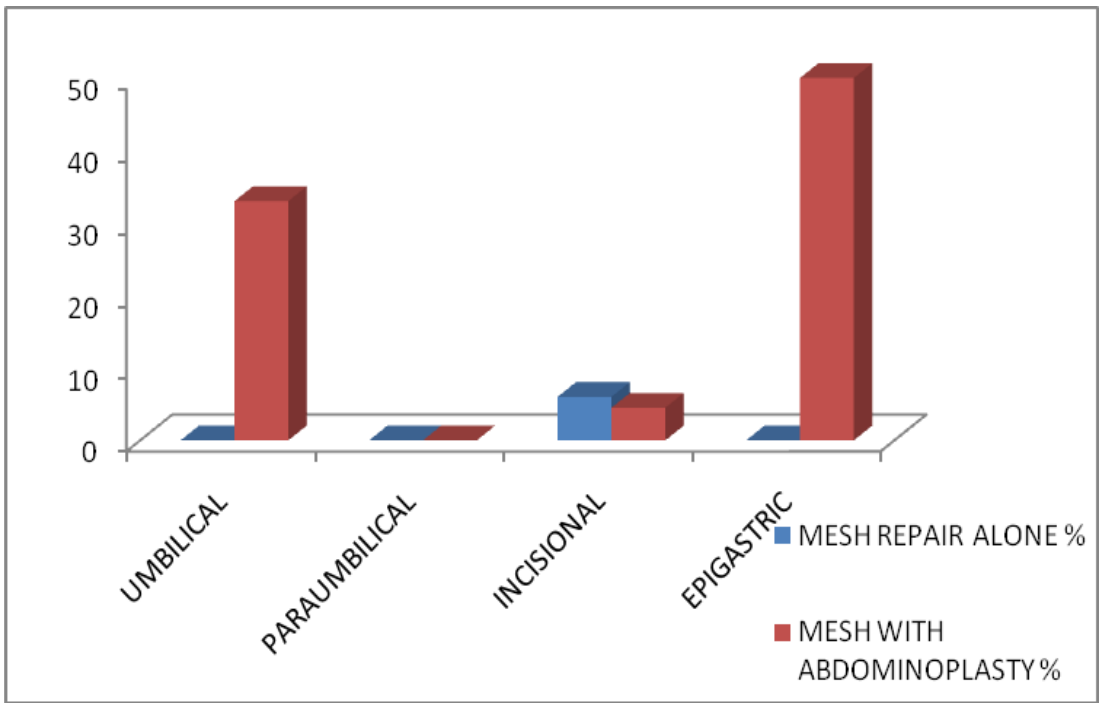
GRADE 2 severe erythrema with other features of inflammation at and around the wound

GRADE 3 serous or bloody discharge

GRADE 4 presence of pus or deep infection or tissue breakdown or significant haematoma

SURGICAL SITE INFECTIONS

	MESH REPAIR ALONE		MESH WITH ABDOMINOPLASTY		SIGNIFICANCE
	No	%	No	%	
UMBILICAL	5	0	3	33	YES
PARAUMBILICAL	5	0	3	0	NO
INCISIONAL	17	12	22	9	NO
EPIGASTRIC	3	0	2	50	YES



AVERAGE DRAIN COLLECTION PER DAY

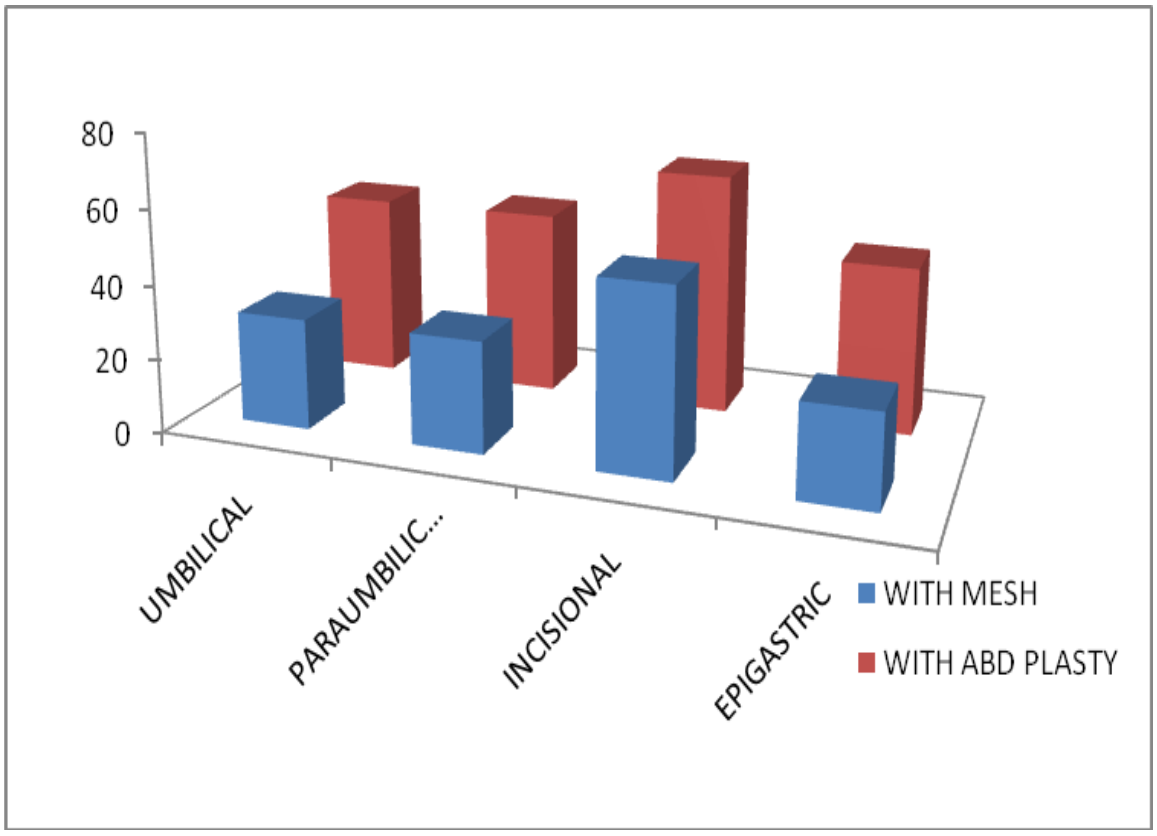
As tissue mobilisation is more in abdominoplasty procedure, theoretically higher chances for drain collection and seroma formation is present

Seroma collection predisposes to wound infection

Keeping the drain for too long also predisposes to wound infection,prolonging hospital stay;and impaires the mobility of the patient

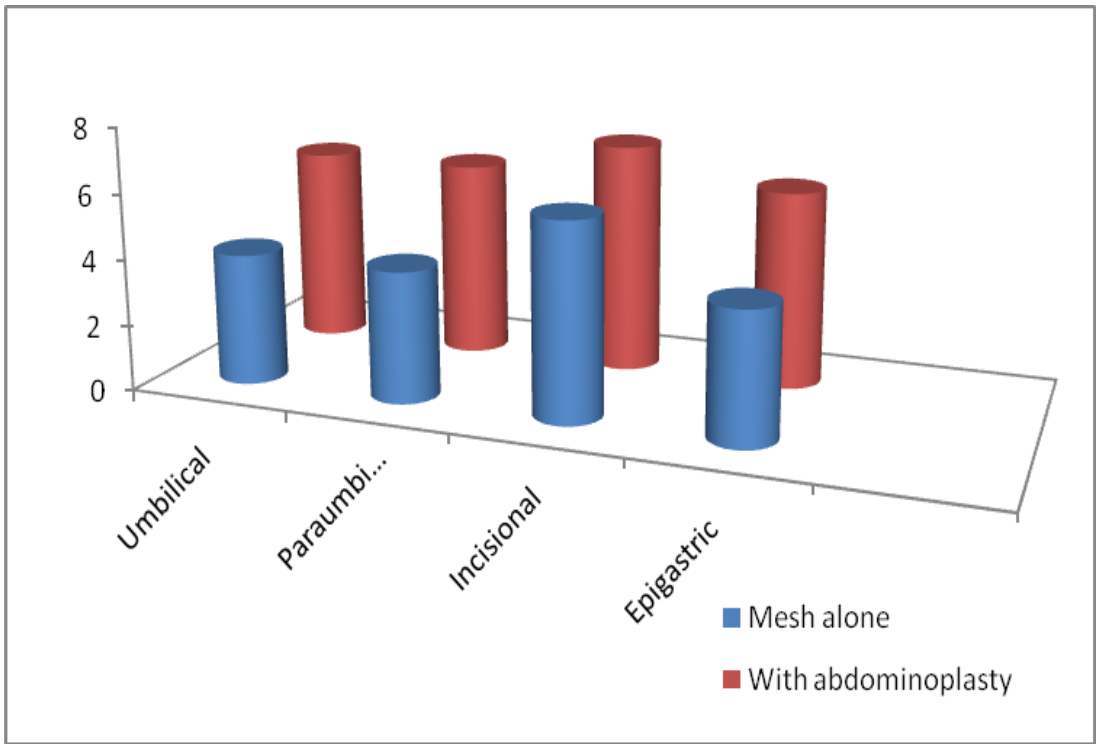
AVERAGE DRAIN COLLECTION PER DAY

	WITH MESH			WITH ABD PLASTY				SIG
		MEAN	SD		MEAN	SD	SE	
UMBILICAL	5	30	6.3	3	50	7.1	9.7	YES
PARAUMBILICAL	5	30	7.1	3	50	1.63	3.31	YES
INCISIONAL	17	50	8.2	22	65	10.18	3.4	YES
EPIGASTRIC	3	25	2.5	2	45	4.5	3.4	YES



NUMBER OF DAYS DRAIN KEPT

	Mesh alone			With abdominoplasty			SE	significance
	No	mean	sd	No	mean	sd		
Umbilical	5	4	0.25	3	6	0.8	0.62	YES
Paraumbilical	5	4	1.03	3	6	0.8	1.1	NO
Incisional	17	6	1.28	22	7	1.08	0.37	YES
Epigastric	3	4	0.08	2	6	0.2	0.31	YES



FLAP NECROSIS

Flap necrosis is a devastating complication in reconstructive surgery.

Minor wound infections can be managed conservatively by local wound care

Deep wound infections and flap necrosis need surgical intervention

Smoking ,COPD,T2DM,connective tissue disorders contribute to post op complications like deep wound infections and flap necrosis

Nicotine decreases macrophages at wound site and delays wound healing. It also causes contraction of blood vessels

Carbon monoxide in smoke decrease oxygen transport

Cessation of smoking ,at least one month prior is advisable for patients with history of smoking

Control of diabetics is necessary to avoid post op infections

Here ,in our study, total 4 cases with incisional hernia had flap necrosis

2 underwent abdominoplasty with mesh repair, and other two cases underwent mesh repair alone

All the 4 cases had diabetics and was on insulin

Patients underwent wound debridement and re suturing, and discharged

	mesh alone		Mesh with abd plasty		SE	sig
	No		No			
Umbilical	5	0	3	0		
Paraumbilical	5	0	3	0		
Incisional	17	11%(2)	22	9%(2)	9.6	NO
Epigastric	3	0	2	0		

RECURRENCE (AT 6MONTHS)

Hernias tends to recur. Recurrent hernias are difficult to operate and manage. Both conservative and surgical managements are available for hernia recurrence. Systemic metabolic defects like T2DM which impairs wound healing, COPD, asthma connective tissue disorders, post op complications, improper care post operatively. For proper wound healing it takes approximately 2-3 years. Low quality of mesh can also be a contributing factor. Low quality mesh shrinks inside the cavity to 50-60% and creates increased tension around sutures. Another contributing factor is mesh migration

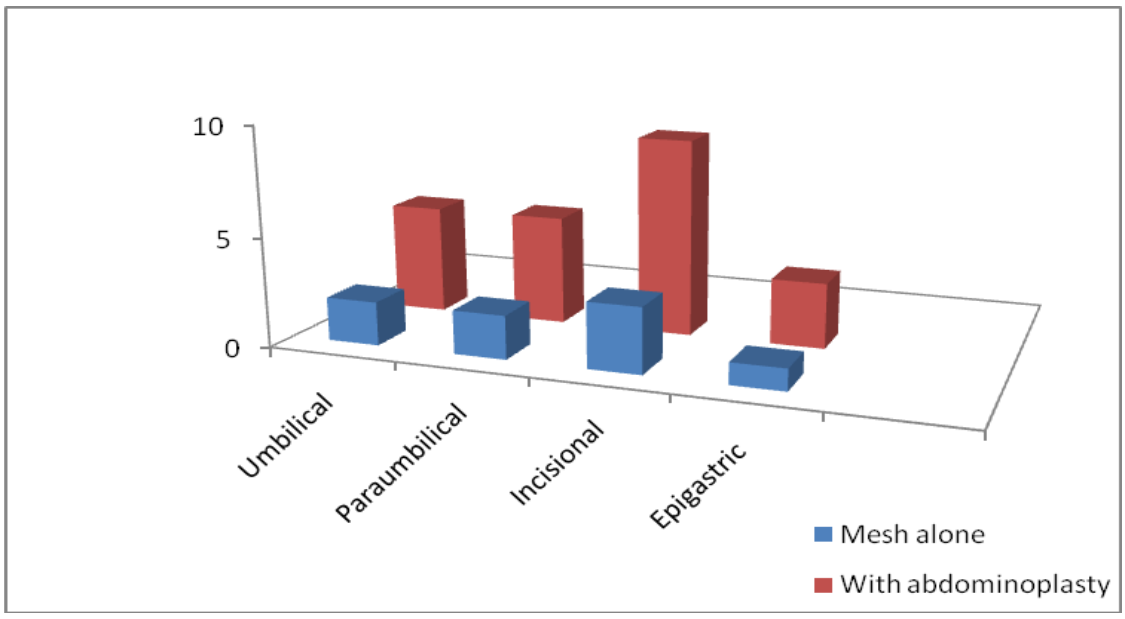
Various literatures and studies around the world indicates, recurrence rates from 5 to 20%.Here in our study of 60 patients, only two had recurrence after 6 months. Both had minor wound infection post operatively. Mesh was same .Both had incisional hernia, one underwent mesh repair alone and other underwent mesh repair with abdominoplasty. They didn't have any history of tobacco abuse or COPD.

As the recurrence in both cases were small , one patients didn't notice the recurrence. Both of them were not willing to undergo surgery because of personal reasons., and advised to follow up properly

	mesh alone		Mesh with abd plasty		SE	SIG
	No		No			
Umbilical	5	0	3	0		
Paraumbilical	5	0	3	0		
Incisional	17	5%(1)	22	4.5% (1)	6.89	NO
Epigastric	3	0	2	0		

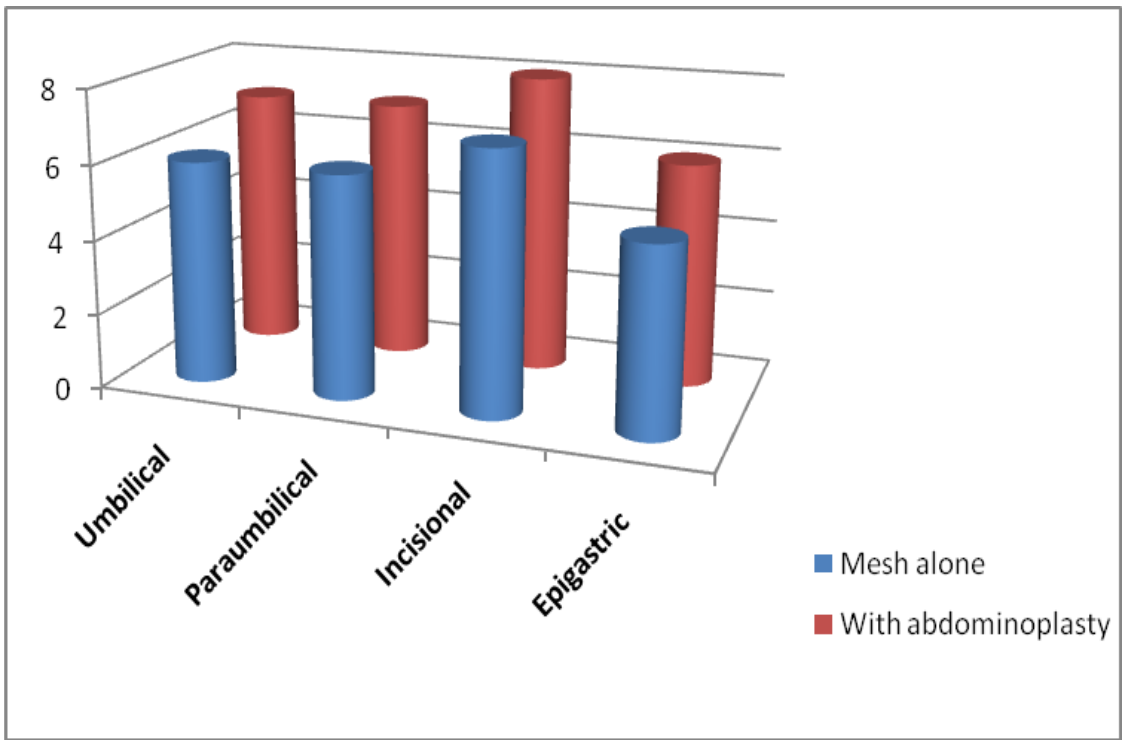
CHANGE IN ABDOMINAL GIRTH (AT ONE MONTH POST OP) (IN PERCENTAGE)

	Mesh alone			With abdominoplasty			SE	sig
	No	Mean	sd	No	mean	sd		
Umbilical	5	2	0.07	3	5	1.6	0.95	YES
Paraumbilical	5	2	0.4	3	5	0.8	0.4	YES
Incisional	17	3	0.5	22	9	0.7	0.18	YES
Epigastric	3	1	0.4	2	3	1	0.741	YES



DURATION OF HOSPITAL STAY in days

	Mesh alone			With abdominoplasty			SE	significance
		mean	sd		mean	sd		
Umbilical	5	6	1.16	3	7	0.8	0.69	NO
Paraumbilical	5	6	1.09	3	7	0.8	0.66	NO
Incisional	17	7	1.21	22	8	1	0.14	NO
Epigastric	3	5	0.8	2	6	2	1.4	NO



DISCUSSION

I have studied 60 cases of ventral hernia. 30 patients underwent mesh repair alone and other 30 patients underwent mesh repair with abdominoplasty as a combined procedure. Umbilical, paraumbilical epigastric and incisional hernias were included in the study in which incisional hernias were more (17+ 22 out of 60). Both techniques were compared in variables like, 1 average duration taken for surgery, 2 average time for ambulation after surgery, 3 average drain collection per day, 4 number of days the drain kept,5 surgical site infection,6 flap necrosis,7 duration of stay in hospital,8 change in abdominal girth,9 recurrence

Average duration for surgery varied from 45 minutes (epigastric hernia) to 105 minutes incisional hernia for patients with mesh repair alone. In combined procedure, time period varied from 75 minutes to 113 minutes.In groups,(umbilical and paraumbilical hernias) there was statistically significant variation in duration of surgery between two procedures,where as in incisional hernia and epigastric hernias, duration was statistically insignificant . In studies conducted by Wagih mommtaz Ghnam duration varied from 120-240 minutes for combined procedures and in our study range was 75 min to 135 minutes .Average time taken for ambulation after surgery varied from 6-7 hours in mesh repair alone

and 6-8 hours in combined procedure. Statistically significant difference was noted only for incisional hernias

No surgical site infections were noted in patients with epigastric and umbilical hernias in those who underwent mesh repair alone. For those who underwent combine procedure ,had infection rate (33% for umbilical hernias 1 out of total 3 cases) and 50% for epigastric hernia (1 out of total two cases) .for para umbilical hernias, no surgical site infections were noted (total 8 cases, 5 and 3 in each group).For incisional hernias 12% for mesh repair (2 out of 17 cases) and 9% for combined procure (2 out of 22 cases) were noted and found to be statistically insignificant .In a study conducted by Wagih mommtaz Ghnam wound infection rate was 8.3% for combined procedure .For abdominoplasty alone ,various literatures showed 8-12% of surgical site infections

There was statistically significant increase in average drain collection per day, number of days drain kept (except umbilical and paraumbilical group), when underwent combined procedure .There was no statistically significant increase in hospital stay in all 4 groups when underwent combined procedure. No seroma formation as a complication were noted during the course of study, but it was noticed in 10-20% in various literature. Here in my study, drains were removed only when the

collection was 10ml or less for two or more consecutive days. This can be a reason for not reporting seroma as a complication in mesh repair group and combined procedure groups

Totally 4 cases of flap necrosis came across the study, 2 in incisional hernia with mesh repair ,and 2 in incision hernia with combined procedure. There were no flap necrosis in other types on either procedures. Incidence of flap necrosis also found to be statistically insignificant in incisional hernia group. In various studies flap necrosis varied from 8-12% when patient under went combined procedure. None of the patients had complications like pulmonary embolism or DVT during the study

Only 2 patients with recurrence came at the end of 6 months follow up. Both with incisional hernia, one underwent mesh repair and other underwent combined procedure. Recurrence also found to be statistically insignificant. In a study conducted by Adel Tolba et al recurrence were nil at the end of two years for those who underwent combined procedure. In study conducted by Davidson et al, recurrence for combine procedure was 7.7%

Change in abdominal girth varied from 1% to 3% (for epigastric and incisional hernias respectively) in mesh repair group. In combined

procedure group ,it varied from 3 to 9% .statistical significance was noted in both groups for change in abdominal girth

VARIABLE	STATISTICAL SIGNIFICANCE			
	umbilical	Para umbilical	incisional	epigastric
Duration	Yes	Yes	No	No
Ambulation	No	No	Yes	No
Drain	Yes	Yes	Yes	yes
Days drain kept	No	No	Yes	Yes
SSI	Yes	No	No	Yes
Flap necrosis	No	No	No	No
Stay	No	No	No	No
Abd girth	Yes	Yes	Yes	Yes
Recurrence	No	No	No	No

CONCLUSION

By combining mesh repair and abdominoplasty

1 Favourable outcome in means of recurrence cosmesis and patient satisfaction

2 mean duration for surgery increased

3 mean drain collection per day increased

4 number of days drain kept (in incisional and epigastric hernia)

5 significant increase in abdominal girth

are increased average time taken for ambulation was increased for incisional hernia group alone. Statistically significant increase in surgical site infections were noted for umbilical hernia and epigastric hernia,. Studies with larger pool of patients needed to arrive at a definitive conclusion. Flap necrosis incidence and recurrence were also statistically insignificant in both groups .Statistically significant change in abdominal girth was noted in all types of hernias in both groups

In general, even though there was increase in duration of surgery, hospital stay, drain collection per day, number of days the drain kept, complications like surgical site infections flap necrosis ,recurrence were insignificant. Significant change in abdominal girth was noted.

So our study favours combine ventral hernia repair with abdominoplasty for selected patients

- With stable BMI over 6 months
- With realistic idea regarding cosmetic outcome
- Ready for proper 'self care after surgery for at least 3 months
- Ready to maintain healthy eating habits, following surgery
- Well controlled co morbidities like T2DM, asthma, COPD

One advantage of combining the procedure is to avoid unnecessary anaesthesia and hospital stay for one more procedure

Those with higher BMI(more than 35), excessive fat around waist, flanks, combining the procedure may not be useful

Good cosmetic outcomes are also depends upon pattern of distribution of fat

KEY TO MASTER CHART

M	Male
F	Female
Y	Yes
N	No
BMI	Body Mass Index
T2DM	Type 2 Diabetes Mellitus
COPD	Chronic Obstructive Pulmonary Disease
SHTN	Systemic Hypertension
CAD	Coronary Artery Disease
SSI	Surgical Site Infections

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PROFORMA COMPARATIVE STUDY OF MESH REPAIR ALONE AND MESH REPAIR WITH ABDOMINOPLASTY FOR VENTRAL HERNIAS IN GMKMCH,SALEM DURING JAN 2016-SEPT 2017 ”

VENTRAL HERNIA

Name:

Address:

Age/sex: **BMI** **abdominal girth**

RELIGION:

O.PNo:

I.P No:

D.O.A:

TIME & DATE OF OPERATION:

D.O.D:

CHIEF COMPLAINTS:

PAST HISTORY:

1. DM : Yes/ No
2. TB : Yes/ No
3. EPILEPSY
4. MALARIA
5. PREVIOUS SURGERY

6. JAUNDICE
7. CIRRHOSIS

PERSONAL HISTORY

SMOKER

ALCOHOLIC

INITIAL ASSESSMENT OF PATIENT:

1.Vitals:

PR :

BP :

RR :

Temperature :

2.GENERAL SIGNS:

Pallor

Tongue

Skin

Icterus

Cyanosis

Lymphadenopathy

ASSESSMENT OF ABDOMINAL SWELLINGS:

INSPECTION:

i) Side of swelling:

ii) Extent:

iii) Shape:

iv)Surface:

v) Margin:

vi) Skin over the swelling:

PALPATION

1. Temperature
2. Tenderness
3. Consistency
4. Get above the swelling
5. Inspectory findings : confirmed

PERCUSSION

AUSCULTATION

Bowel sounds

ABDOMINAL MUSCLE TONE:

EXTERNAL GENITALIA:

PER RECTAL EXAMINATION:

SYSTEMIC EXAMINATION:

CVS:

RS:

CNS:

MUSCULO SKELETAL SYSTEM:

CLINICAL DIAGNOSIS:

INVESTIGATIONS:

A. HB%:
B. GROUPING & TYPING:
C. BT/CT:
D. PCV:
E. HBSAg : HIV:
F. ECG:
G. URINE: Macro:

Micro :

Albumin:

Sugar:

H. BLOOD: RBS:

BLOOD UREA:

SER.CREATININE

I. CHEST X RAY PA VIEW:

J. ABDOMEN & PELVIS USG:

K. Wall defect size

PRE-OPERATIVE DIAGNOSIS:

OPERATIVE PROCEDURE:

ANESTHESIA:

INCISION:

SURGICAL PROCEDURE:

- **Duration of surgery:**
- **Duration of hospital stay:**
- **Ambulation:**

POST-OPERATIVE PERIOD / COMPLICATION

A Surgical site infections

B Seroma/Hemotoma

C Flap necrosis

D Recurrence:

E Abdominal girth

OUTCOME OF THE TREATMENT:

Method: mesh repair alone

FOLLOW-UP IMPROVEMENT OF SYMPTOMS

HEALING

2nd week:

4th week:

2nd month:

6th month:

1st year

2nd year:

Method:mesh repair with abdominoplasty combined

FOLLOW-UP IMPROVEMENT OF SYMPTOMS
HEALING

2nd week:

4th week:

2nd month:

6th month:

1st year

PATIENT CONSENT FORM

STUDY TITLE:

COMPARATIVE STUDY OF MESH REPAIR AND MESH REPAIR WITH ABDOMINOPLASTY FOR VENTRAL HERNIAS IN GMKMCH,SALEM DURING JAN 2016-SEPT 2017 ”

Department of General surgery, GMKMCH

PARTICIPANT NAME : AGE : SEX:

I.P. NO :

I confirm that I have understood the purpose of surgical/invasive procedure for the above study. I have the opportunity to ask the question and all my questions and doubts have been answered to my satisfaction.

I have been explained about the possible complications that may occur during and after medical/ surgical procedure. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason.

I understand that investigator, regulatory authorities and the ethics committee will not need my permission to look at my health records both in respect to the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from the study.

I hereby consent to participate in this study for various surgical/invasive procedures and their outcomes.

Time :

Date : Signature / Thumb Impression Of Patient

Place :

Patient’s name:

Signature of the investigator: _____

Name of the investigator : _____

MASTER CHART

UMBILICAL HERNIA WITH MESH ALONE

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COL			NUMBER OF DAYS DR			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPI		
														MEAN	SD				MEAN	SD		MEAN	SD				MEAN	SD		MEAN	SD
1	MUNIYAMMAL	55	F	653	24	N	N	N	N	N	55			6			N	30			4			N	N	2			5		
2	POOVAYIAMMAL	60	F	32156	24.3	N	N	N	H	A	65	55	6.324555	7		0.894427191	N	40			4	4		N	N	3	2		6		
3	RANGAMAL	45	F	4326	27	N	N	Y	N	N	55			7	6		N	20	30	6.32455532	3		1.095445115	N	N	1	2	0.632455532	5	6	1.166190379
4	RATHINA	51	F	43123	21.5	N	N	N	N	N	45			5		0.894427191	N	30			6			N	N	2			8	5.8	
5	RADHIKA	40	F	43212	23	N	N	N	N	N	55			5			N	30			3			N	N	2			5		

UMBILICAL HERNIA MESH WITH ABD PLASTY

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	VEDIYAPPAN	53	M	5412	25	Y	Y	N	N	N	75			5			N	55			6	6		N	N	3			7	7	
2	NAGARAJ	45	M	45761	26.3	N	Y	Y	N	N	80	75	4.082483	6		0.816496581	y	55		7.071067812	7		0.816496581	N	N	5	5	1.632993162	8	7	0.816496581
3	SELVI	33	F	45621	26	N	N	N	N	N	70			7	6		N	40	50		5			N	N	7			6		

PARAUMBILICAL HERNIA MESH ALONE

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	RAJA	45	M	45321	29	N	N	N	N	N	65			7			N	30			3			N	N	2.5			5		
2	KARUPPAN	63	M	54312	28	Y	Y	N	N	N	67		2.75681	5	6	0.894427191	N	35			6	4		N	N	1.5	2		8		
3	NATARAJAN	51	M	12312	22	N	N	N	H	N	63	63		6			N	25	30	7.071067812	4		1.095445115	N	N	1.5	2	0.447213595	6	6	1.095445115
4	NATESHAN	61	M	3215	26	N	N	N	N	N	60			5			N	40			4			N	N	2.5			6	6	
5	NAGAMMAL	63	F	32150	24.5	N	N	N	N	T	60			7			N	20			3			N	N	2			5		

PARAUMBILICAL HERNIA MESH WITH ABD PLASTY

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	VERAGE DRAIN COLLECTION PER D			NUMBER OF DAYS DRAIN KEPT			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL STAY		
1	RAFEEK	56	M	4376	26.7	N	N	N	N	N	97			5			N	52			6	6		N	N	6	5		7		
2	CHITRA	44	F	9871	25.2	N	N	N	N	N	85			7	6	1.154700538	N	50	50	1.632993162	7		0.816496581	N	N	4		0.816496581	8	7	0.816496581
3	SUMATHY										80	87.33	7.133645	7			N	48			5			N	N	5			6	7	

INCISIONAL HERNIA WITH MESH ALONE

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	BUVANESHWARY	60	F	32651	27	N	N	Y	Y	N	105			9			Y	55			7			Y	N	3	3		9		
2	POOVAYI	54	F	37851	26	N	N	N	N	N	95			6			N	40			5			N	N	2.5			6		
3	KEERTHANA	45	F	43276	23	N	N	N	N	N	70			6			N	40			4			N	N	2		0.568796459	6		
4	MYLISAMY	65	M	44327	25	Y	Y	N	N	N	96			9			N	40			5			N	N	2.5			6		
5	RANGANAYAGI	45	F	2312	26	N	N	N	N	N	96			6			N	55			6	6		N	N	3			8		
6	ALAMELU	60	F	34612	32	N	N	N	N	N	110			6	7.9412	1.513491804	N	40	50		5	6	1.283377896	N	N	2.5	3		6		
7	CHINNAMMAL	47	F	32531	27	N	N	N	N	N	135			10			N	55	50	8.224783208	7			N	Y	2.5			9	7	
8	PAPAYEE	42	F	54329	26	N	N	N	N	N	130	105	14.00098	6			N	60			6			N	N	3.5			7	1.2113	
9	PERUMAL	56	M	4326	27	Y	Y	N	N	N	110	104.8		10			N	60			8			N	N	3.5			8		
10	NAGAPPAN	60	M	45321	24	Y	Y	N	N	N	100			7			N	55			7			N	N	3			7		
11	ANANDAN	52	M	5476	23	Y	Y	N	N	N	105			9			N	40			4			N	N	3.5			5		
12	KRISHNASAMY	69	M	57892	25	Y	Y	N	N	N	110			9			Y	60			8			Y	N	2.5			8		
13	SARAVANAN	52	M	4325	26	Y	Y	N	N	A	100			7			N	60			7			N	N	3			8		
14	MURUGAN	55	M	54871	25	y	y	N	H	N	105			8			N	40			4			N	N	3.5			5		
15	KUPPAMMAL	66	F	3657	22	N	N	N	N	N	105			9			N	50			6			N	N	2.5			7		
16	ARAYEE	68	F	1287	25	N	N	N	N	N	105			8			N	55			7			N	N	4			7		
17	MARIYAMMA	66	F	5761	25.3	N	N	N	N	N				10			N	45			6			N	N	4			8		

INCISIONAL HERNIA MESH WITH ABDPLASTY

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	BEEVATHU	66	F	47654	24.3	N	N	N	N	A	124			6			N	60			7			N	N	9			8		
2	SREENI	40	M	3451	22	Y	Y	N	N	N	110			7			N	60			7			N	N	10			8		
3	NEELA	66	F	1276	21	N	N	N	N	N	115			8			N	70			6			N	N	8			7		
4	PATCHIYAMMAL	57	F	3267	23.5	N	N	N	N	N	110			7			N	80			9			N	N	9.5			9		
5	SELVI	47	F	4387	23.5	N	N	N	N	N	120			6			N	75			7			N	N	7.5			8		
6	VANITHA	41	F	43178	24.7	N	N	N	N	N	135			6			N	65			7			N	N	9.5			9		
7	VELUSAMY	45	M	3412	22	Y	Y	N	N	N	136			6			N	60			5			N	N	8.5	9	0.783349452	6		
8	MURUGESHAN	55	M	12897	23.1	N	N	N	H	N	100		13.31314	7			N	70	65	10.11834731	6	7	1.087114613	N	N	9	9		7	8	
9	VENKATESHAN	44	M	5487	23.2	N	N	N	N	N	125	113.2		6			N	70			8			N	N	9.5			9	8	1
10	PAPATHI	33	F	3487	23	N	N	N	N	N	90			6	7.0455	1.065034047	N	50		9.885710532	8			N	N	9			9		
11	PERAGALAN	47	M	39876	21	N	N	N	N	N	90			7			N	50			7			N	N	9.5			7		
12	MANGAMMAL	62	F	4098	25	N	N	Y	N	N	115			6			Y	80			9			Y	N	10			9		
13	MARY	46	F	45321	26	N	N	N	H	N	100			7			N	50			6			N	N	9			6		
14	ZAINABA	56	F	4328	24.3	N	N	N	N	N	115			6			N	60			6			N	Y	8			7		
15	KUMARAN	55	M	45987	22.3	N	N	N	N	N	110			7			N	60			6			N	N	9			9		
16	ARAPULI	66	M	56731	22.7	N	N	N	N	N	110			8			N	70			5			N	N	9			7		
17	PATCHIYAPPAN	47	M	5631	22.3	Y	Y	N	N	N	100			8			N	85			7			N	N	7			9		
18	DINAGAKARAN	47	M	4590	25	Y	Y	N	N	N	95			7			N	65			8			N	N	10			8		
19	RAJAN	55	M	38765	26	Y	Y	N	N	N	115			7			N	70			8			N	N	9			9		
20	MOORTHY	48	M	4677	25	Y	Y	N	N	N	115			8			N	70			7			N	N	10			8		
21	VASANTHA	66	F	4531	23.3	N	N	Y	Y	N	125			9			Y	60			8			Y	N	9			9		
22	NARASIMHAN	44	M	5666	25.8	N	N	N	N	N	135			10			N	50			7			N	N	9			8		

EPIGASTRIC HERNIA WITH MESH

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	JEYA	44	F	54321	22	N	N	N	N	N	45		5.715476				N	25			4				N	0.5			5	5	
2	MEENAKSHY	50	F	4321	23.7	N	N	N	N	N	52			5			N	30	25		5	4	0.5		N	1	1	0.40824829	6	5	0.816496581
3	SADAYAN	51	M	5123	22	N	N	N	N	N	38	45		7	6	0.816496581	N	20			3				N	1.5			4		
														6																	

EPIGASTRIC HERNIA MESH WITH ABDPLASTY

	NAME	AGE	SEX	IP	BMI	ALCOHOL	SMOKING	T2DM	SHTN/CAD	COPD/TB/ASTHMA	DURATION OF SURGERY			AMBULATION AFTER SX			SSI	AVERAGE DRAIN COLLECTI			NUMBER OF DAYS DRAIN			FLAP NECROSIS	RECURRENCE	CHANGE IN ABD GIRTH			DURATION OF HOSPITAL S		
1	POOVAMMAL	46	F	4321	25	N	N	y	N	N	85		24.14214	6.5		0.5	Y	40			4	6			N	2	3		4	6	2
2	BARKATHALI	55	M	145342	27.2	N	N	Y	N	N	65	75		5.5	6		N	50	45		8	6	2		N	4		1	8		